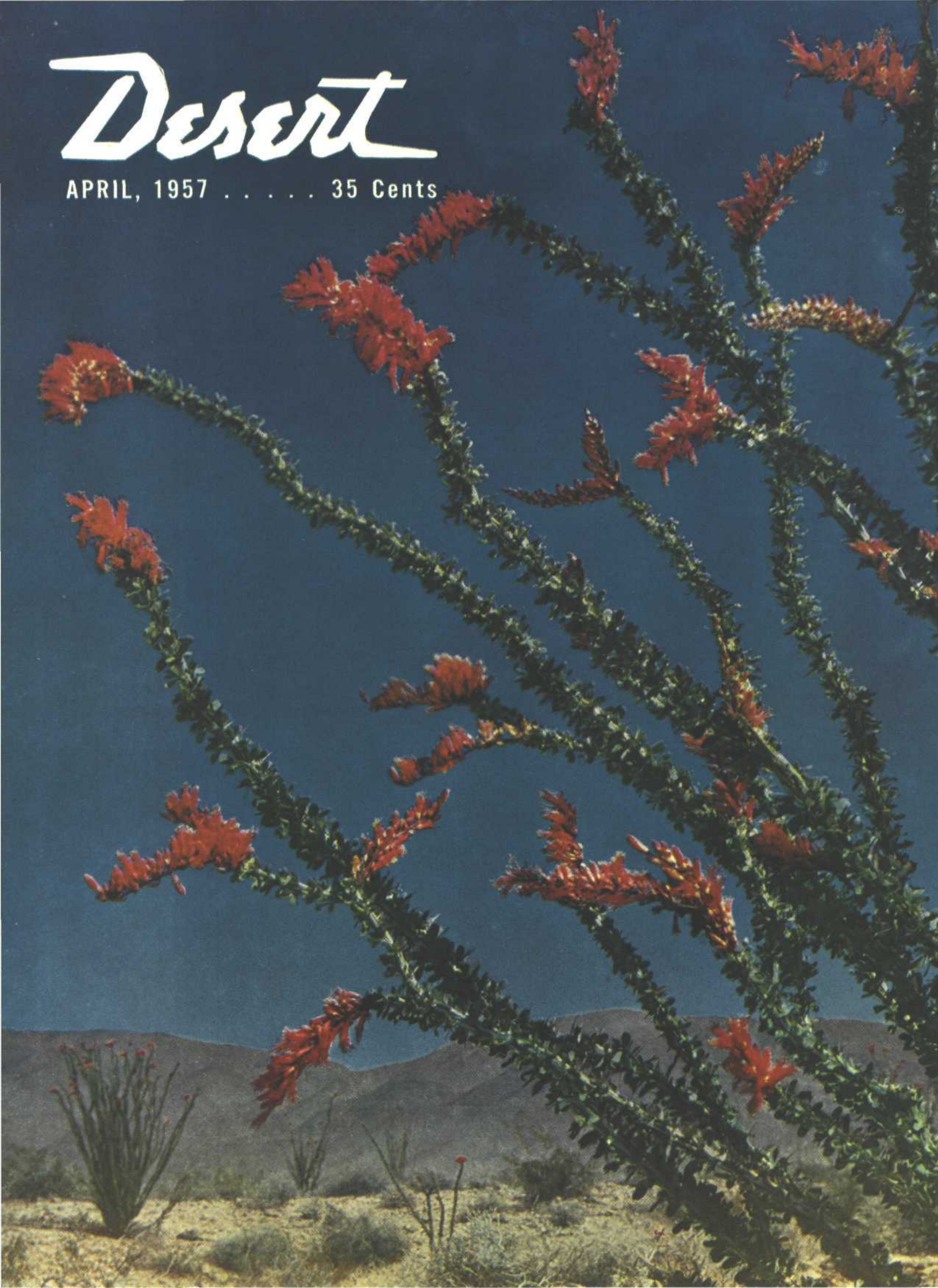
Desert

APRIL, 1957 . . . . . 35 Cents



Ancient Kiva in Bandelier National Monument. Photo courtesy New Mexico State Tourist Bureau.

DESERT UNVEILING

By Amy Viau
Santa Ana, California

From the rim of great distance
Where the sky is tucked in,
New morning spreads crimson
Where night shades have been.

The crests of saguaro
Are etched in mid air
While unhurried silence
Pervades everywhere.

And in the cool freshness
Of unstirring reign,
The desert unveils
Its luring domain.

• • •

DESERT DAWN

By Georgia Jordan
Ocean Beach, California

The Desert Dawn is softly shedding light,
As she dismisses stars and night,
And blushes into heaven's blue,
To listen as a mighty Silence speaks,
"My peace I leave, My peace I give to you."

Puye Listens

By Ada Virginia Hull
Hollywood, California

Hushed the rhythm of the tom-tom;
Silent now the warriors' cry,
Where the quiet cliffs of Puye
Face a gray and cloudless sky.

Sleeping cornfields sometimes shudder
At a sound like distant thunder!
Ghosts of ancient Tewa chieftains
Wake to listen—wake to wonder!

While the White Man tests the rockets
Miles away—from earth to sky!
Ghosts of ancient Tewa chieftains
Shake their heads—and mutter, "Why?"

• • •

DESERT HAVEN

By Sylvia Reeves
Tucson, Arizona

Shadow patterns, knit by sunshine
Shuttling through the lone mesquite
Dainty as a lace mantilla,
Shelter all who seek retreat.

SPRING MORNING

By Helena Ridgway Stone
South Pasadena, California

It is as though an artist, overnight,
Has dipped his brush deep in a tube of green
And touched the desert, making emerald bright
Where only sage-gray drabness has been seen.
Alone, through silent hours he toils unaided,
Stirring in stardust for a silver hue.
And I awake to find that winter's faded—
And desert sands are carpeted anew!

Truth Dwellers

By Tanya South

None can attest to Truth so well
As they who only in it dwell.
They seem to stand apart, to live
With purpose but to do and give
For others. And an exaltation
So guides their every mood and way,
That neither burden nor privation
Can dismay.

DESERT CALENDAR

March 13-April 3—John Hilton Exhibit, Desert Magazine Art Gallery, Palm Desert, California. (See page 26.)
April 3-22—Marjorie Reed Exhibit, Desert Magazine Art Gallery, Palm Desert, California. (See page 26.)
April 4-7—Art of Arizona Show on grounds of Phoenix Public Library.
April 4-7—Community Fair, Blythe, California.
April 6—Desert Museum field trip to Deep Canyon, from Palm Springs, California. (Field trips also are planned for the 13th and 20th, but destinations not yet announced.)
April 6—Desert Magic Flower Show, Needles, California.
April 6-7—9th Annual De Anza Jeep Cavalcade, from Hemet, California.
April 6-7 — Livestock and Quarter Horse Show, Tucson.
April 6-7—Dons Club Travelcade (by bus only) to Grand Canyon, from Phoenix.
April 8-12—Desert Caballeros Ride, Wickenburg, Arizona.
April 10-14—County Fair, Yuma.
April 12-14 (tentative)—Annual Lilac Show, Palmdale, California.
April 13—Annual Play Day at White Sands National Monument, Alamogordo, New Mexico.
April 13-14 — 11th Annual Rabbit Show, Roswell, New Mexico.
April 13-14 — Spring Horse Show, Phoenix, Arizona.
April 14-May 5—Festival Art Show, Tucson.
April 16 — Old Timers' Celebration, Deming, New Mexico.
April 18—Spring Flower Show, Mesa, Arizona.
April 19 — Penitente Passion Play, Ranchos de Taos, New Mexico.
April 21—Easter Sunrise Services at most Southwest Communities. Make local inquiries. Outstanding programs at Grand Canyon and Wickenburg (horseback), Arizona; Death Valley, Red Rock Canyon, Juniper Hills, California; Taos, N. M.
April 21—Western Saddle Club Gymkhana, Phoenix, Arizona.
April 21-22—Lions Club Rodeo, Battle Mountain, Nevada.
April 21-24—Ceremonial Dances at Cochiti, San Felipe and Santo Domingo pueblos, New Mexico.
April 26—San Xavier Fiesta, Tucson.
April 26-28—8th Annual Fiesta and Rodeo, Truth or Consequences, New Mexico.
April 27—Fourth Annual Wild Burro Barbecue, Bullhead City, Arizona.
April 27 — Nizhoni Dances at the University of New Mexico, Albuquerque.
April 27-28—Horse Show and Kid's Rodeo, Yuma.
April 27-28, May 4-5, 11-12—30th presentation of the Ramona Pageant, Hemet, California.
April 28—Annual Wildflower Festival, Community Ham Dinner, Turtle Race, Hi Vista (east of Lancaster), California.
April 29-May 19—23rd Annual Junior Indian Art Show, Museum of Northern Arizona, Flagstaff.
April 30—Square Dance Fandango, Tucson.
Week prior to Easter—Yaqui Indian Ceremonials, Tucson.

Volume 20 APRIL, 1957 Number 4

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Address Correspondence to Desert Magazine, Palm Desert, California

Artist's conception of Glen Canyon dam and bridge. Prominent landmark left of dam is known as the Beehive.

Dam in Glen Canyon

When man erects a mighty dam across the Colorado River at Glen Canyon, a vast region's way of life will vanish like the desert sunset, and a new era will dawn. The upper Colorado will be harnessed; white water rapids will be submerged beneath a placid lake; impassable canyons will become blue water fiords, their fingers extending into the red sandstone cliffs in many directions; inaccessible canyon mysteries will be inundated and new secrets of the land revealed along a newly-created shoreline. A city will rise from the desert floor; new factories will turn their wheels with power from the impounded water. People will come—fishermen, boatmen, pleasure-seekers, scientists, engineers—and a few who loved the turbulent river and the sheer canyon walls which will be lost to them forever. Wildlife, vegetation, man, the canyon vistas—all except the weather—will feel the impact of this great dam.

By NELL MURBARGER
Maps by Norton Allen

DEEP IN THE RED sandstone country where Arizona joins Utah, man is sowing the seeds of a miracle that will manifest itself for generations to come and in ways now past all knowing.

In the course of that miracle-making, a tawny river will pass through a five-year chrysalis to emerge as a clear, blue lake. Sun-scorched canyons will be transformed into dim-lighted deeps where fishes will swim; old landmarks will be lost forever, new place-names born. Indian trails and rough jeep roads will be replaced by wide paved highways, and a modern city—or cities—will spring from a desert waste.

All this because of a concrete wedge to be driven between the high sheer walls of Glen Canyon.

Major unit in the $760,000,000 Colorado River Storage Project—one of the most stupendous river control programs ever devised—Glen Canyon dam will be situated 13 miles down stream from the Utah-Arizona state line. Planned as the world's fourth-highest dam, its bedrock-to-crest height of 700 feet will impound a lake covering, at capacity, 153,000 acres. Extending along the main course of the Colorado for 187 miles, up the San Juan for a distance of 71 miles, and for as much as a dozen miles into scores of deep and now near-inaccessible side canyons, this new desert lake will contain, at capacity, water sufficient to flood the entire state of Indiana to a depth of 14 inches. Its 1500 miles

of shoreline will be as picturesquely rough as that cut by the fiords of Norway.

Programs of this scope, needless to say, are never completely popular with everyone affected, and before the Colorado River Storage Project was approved by both houses of Congress and signed into law by President Eisenhower last April 11, it had run a long and bitter gauntlet of criticism and condemnation, and had been pared, pruned and compromised.

Some of these concessions, naturally, stemmed from the public's growing reluctance to underwrite further expenditures for gigantic federal reclamation projects. Conservation and wilderness groups also offered strong resistance, particularly in the matter of Echo Park dam, which they succeeded in having eliminated from the program. But the strongest opposition came in the familiar guise of Colorado River politics.

Rivers and political intrigue—particularly in our arid Southwest—seem fated to go hand in hand. Especially is this true of the Colorado, which complicates matters by feeding upon half the states west of the Rocky Mountains. With local sources of water supply wholly inadequate to meet the needs of pyramiding populations, the political question of who-gets-what-and-how-much from this interstate and international river has become progressively involved until every gallon of silt-laden liquid flowing in its channel is literally loaded with dynamite!

Seeking to effect an equitable division of the Colorado's great water and power potential, representatives of the several litigant states in 1922 adopted an agreement known as the Colorado River Compact. Under terms of this pact the river was divided legally into two portions termed the Upper and Lower Basins, with the dividing line at Lee's Ferry, Arizona. The river's upper basin, it was provided, must deliver to the lower basin not less than 75,000,000-acre-feet of water in any period of 10 consecutive years, including water to be allocated to Mexico. After this amount of water has passed Lee's Ferry into jurisdiction of the lower basin, the upper basin (comprising the states of Wyoming, Colorado, Utah, New Mexico and Arizona) is given the right to withhold for its own use up to 7,500,000-acre-feet of water yearly.

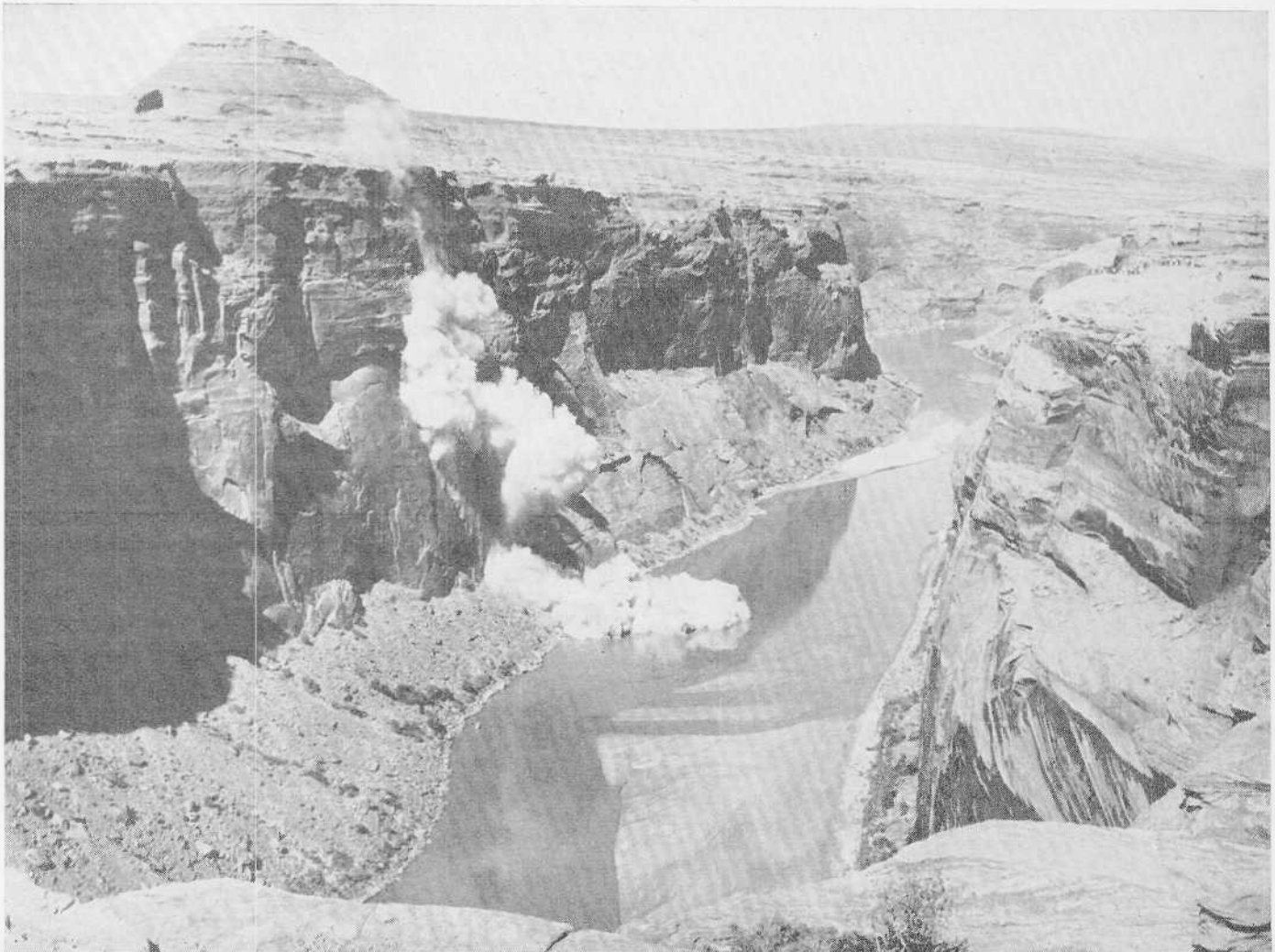
In the 35 years since acceptance of the Compact, half a dozen large dams have been constructed in the lower basin and are now supplying water and power to millions of consumers in that division. Meanwhile, however, the Colorado's upper basin has remained largely undeveloped, and the fact that it has had no adequate means of utilizing its apportioned share of water has meant that each year from 4,000,000 to 22,000,000 - acre - feet have been flowing unused past Lee's Ferry into the lower basin. Since the Colorado River Storage Project will put an end to this beneficent outpouring of water, it goes without saying that the bill was not popular with lower basin interests.

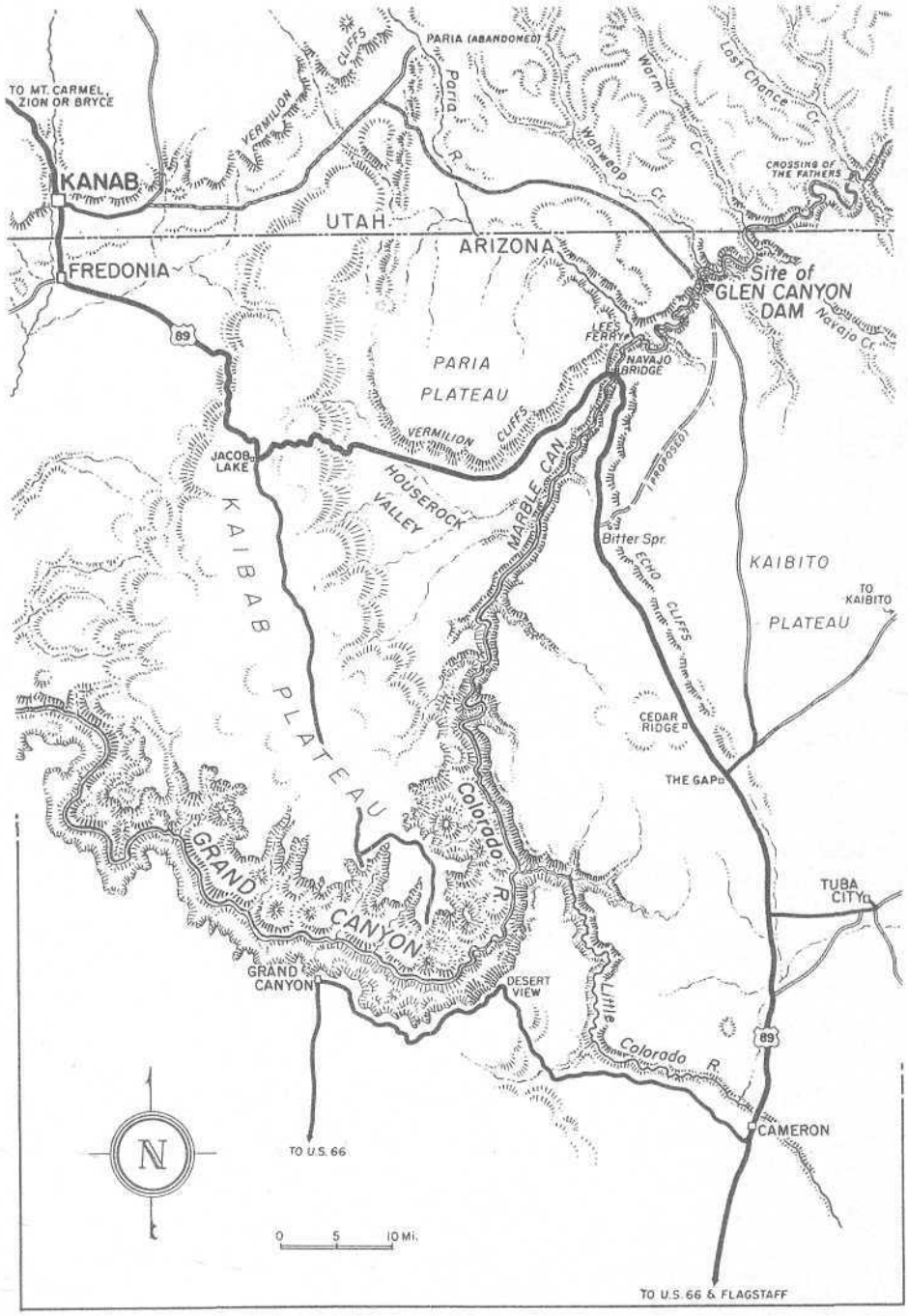
The project, as approved by Congress, calls for construction of storage dams in five states, the whole providing approximately 32,000,000-acre-feet of reservoir capacity and 1,100,000 kilowatts of electrical generating capacity. About 80 per cent of these totals (26,-000,000-acre-feet, and 900,000 kilowatts) will be supplied by the project's major and initial unit, Glen Canyon dam, where work got under way officially October 15, 1956, when President Eisenhower pressed a button in Washington, D.C., to fire the first round of shots at the damsite, nearly 2000 miles distant.

Less than two months after this history-making blast, I journeyed to Kanab, take off point for the damsite on the Utah side of the river.

Kanab, in summer, is a very pleasant place. Due to its abundant sunshine,

The blast triggered in Washington by the President on October 15 of last year which officially inaugurated construction of the dam. View is upstream. Photograph by A. J. Randolph.





clear air, nearby wide-open spaces and scenic surroundings, it has become a favorite locale for filming Western movies, which activity, in turn, has inspired the erection of numerous swank motels and lodges of the type endorsed by Duncan Hines, and has brought to the place a notable degree of prosperity. December, however, is a different story climatically, and my arrival in this mile-high sandstone country of southcentral Utah found the sky upholstered in heavy clouds, with hard-frozen sleet pellets peppering the streets, and an icy gale blowing.

Despite this inclement weather, I had never seen Kanab as busy as it was on this blustery winter day!

Thronging its short main street were assorted vehicles bearing the insignia of the U. S. Bureau of Reclamation, orange-colored trucks of the state highway department, jeeps of all ages, hurrying men in khaki drill trousers and construction helmets, Indians in Pendleton blankets, cowmen in blue jeans and Stetsons, and obvious employment-seekers in cars bearing license plates from half the states of the union. While I was making a purchase in a grocery store, the woman clerk asked if I was "moving in." I said no—that I was in town for only a few days, on business.

"Well, you'll find plenty of it here," remarked the woman briskly. "We've got more business than anything else!"

This, I soon learned, was more than a mere pleasantry. The town was positively booming! Motels were displaying No Vacancy signs, restaurants were packed with patrons, every trailer park was bulging. Since I never go on a field assignment without my camp outfit, I solved the matter of lodging and eating accommodations by driving out to the edge of town, where I set up housekeeping under a juniper tree.

Next morning I set out to learn the story behind this sensational and unseasonable boom.

On a rounded hill overlooking Kanab stands a rambling one-story building which formerly housed the local high school, but was replaced several years ago by a larger and more modern structure. In this outmoded school building the U. S. Bureau of Reclamation has set up temporary headquarters for the Glen Canyon project. Highest ranking official here is L. F. Wylie, project engineer, upon whose shoulders rests responsibility for construction of the dam.

Dynamic, determined, good-looking and middle-aged, Wylie serves also as liaison officer between the Reclamation Bureau and the Indians, river runners, contractors, ranchers, highway department and all other persons and concerns who wish to do business with the Bureau or to "pick a bone" with it. He also functions as public relations officer, and despite a calendar so full it would be frightening to most folks, he spared me a generous slice of his busy day and visited most affably during the brief periods when he wasn't adjusting some emergency or talking over long-distance telephone to Washington, D.C., and other ports of call.

As organization is perfected, many of Wylie's present duties undoubtedly will be delegated to others, since his background suggests a man whose experience and know-how is much too valuable to be squandered on petty details. Affiliated with the Reclamation Bureau for a quarter of a century, his tours of duty have included four years in construction of Hoover Dam, six years on the All-American Canal in Southern California, three years in the U. S. Marine Corps, three years on an improvement project in Alaska and several years as head engineer on a large development project near Amarillo, Texas. His present Glen Canyon assignment is the largest and most important job he has yet undertaken.

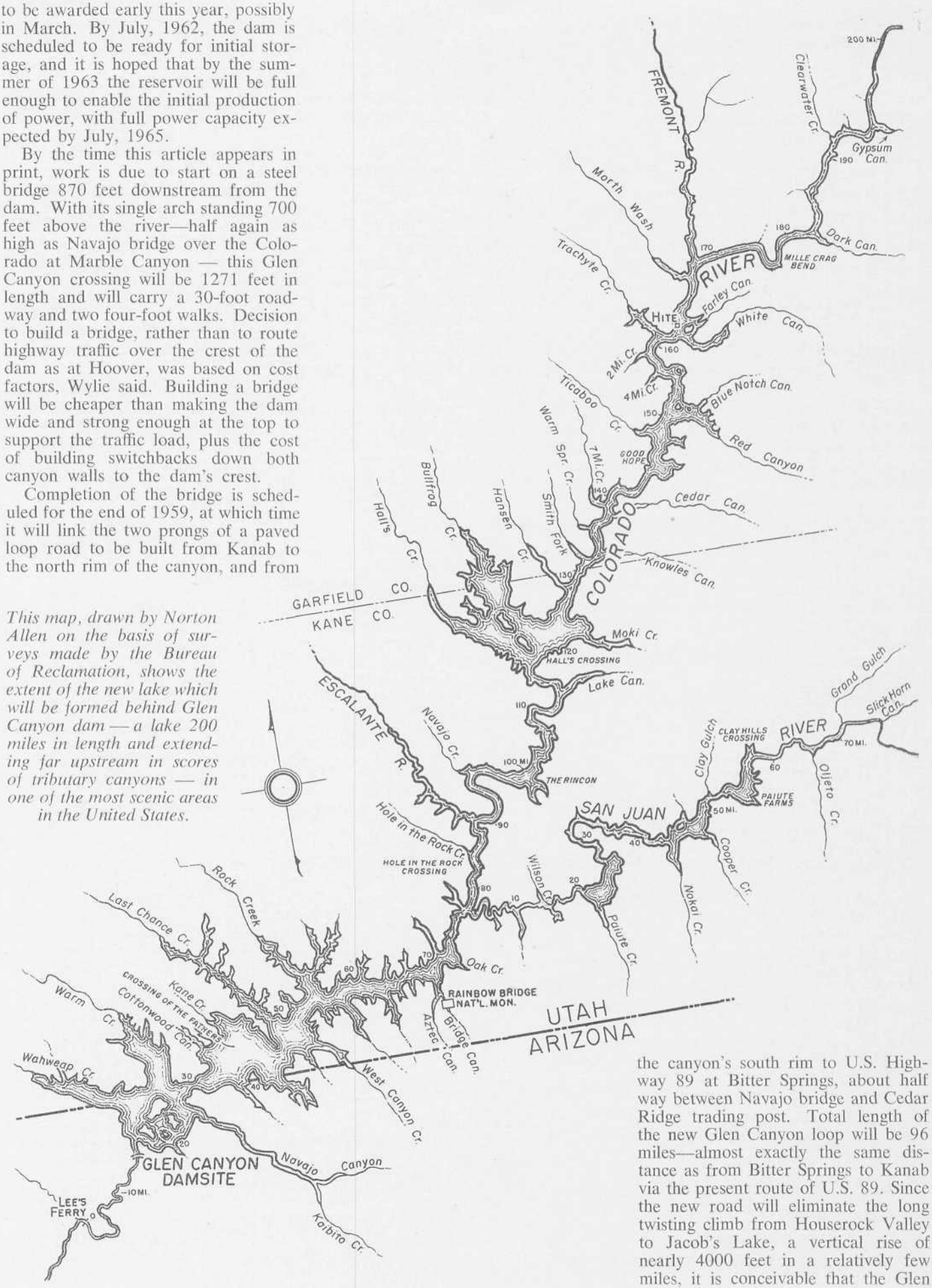
Total estimated cost of the 700-foot Glen Canyon dam, power plant and appurtenant works is $421,300,000, with the entire cost and applicable interest to be repaid within 50 years by sale of power, said Wylie. Not yet allocated, this power will be sold on a bid basis to distributing companies serving, presumably, the states of Colorado, Utah, New Mexico and Arizona.

Bids on the prime contract for construction of dam and power plant are

to be awarded early this year, possibly in March. By July, 1962, the dam is scheduled to be ready for initial storage, and it is hoped that by the summer of 1963 the reservoir will be full enough to enable the initial production of power, with full power capacity expected by July, 1965.

By the time this article appears in print, work is due to start on a steel bridge 870 feet downstream from the dam. With its single arch standing 700 feet above the river—half again as high as Navajo bridge over the Colorado at Marble Canyon — this Glen Canyon crossing will be 1271 feet in length and will carry a 30-foot roadway and two four-foot walks. Decision to build a bridge, rather than to route highway traffic over the crest of the dam as at Hoover, was based on cost factors, Wylie said. Building a bridge will be cheaper than making the dam wide and strong enough at the top to support the traffic load, plus the cost of building switchbacks down both canyon walls to the dam's crest.

Completion of the bridge is scheduled for the end of 1959, at which time it will link the two prongs of a paved loop road to be built from Kanab to the north rim of the canyon, and from



This map, drawn by Norton Allen on the basis of surveys made by the Bureau of Reclamation, shows the extent of the new lake which will be formed behind Glen Canyon dam — a lake 200 miles in length and extending far upstream in scores of tributary canyons — in one of the most scenic areas in the United States.

the canyon's south rim to U.S. Highway 89 at Bitter Springs, about half way between Navajo bridge and Cedar Ridge trading post. Total length of the new Glen Canyon loop will be 96 miles—almost exactly the same distance as from Bitter Springs to Kanab via the present route of U.S. 89. Since the new road will eliminate the long twisting climb from Houserock Valley to Jacob's Lake, a vertical rise of nearly 4000 feet in a relatively few miles, it is conceivable that the Glen

Canyon route may become, in time, the main traveled highway between Flagstaff and Salt Lake City.

That time still is quite a few moons removed—as I discovered next day when I drove from Kanab to the damsite. Not that the present road is bad—on the contrary, it is quite good except for being rough in spots and rather dusty. Work of grading it was begun in July, 1956, and by the time I traveled it in December it had been gravel-surfaced for nearly its entire length, with completion of this phase scheduled for January.

For about 25 miles out of Kanab the present Glen Canyon road follows the old Paria river road. Only three years ago I traveled 104 miles over this road and intersecting sideroads without seeing another person, vehicle, roadsign or occupied house. Houses and roadsigns were still scarce, but of vehicles—especially trucks and jeeps—there was now no lack. As work on the Glen Canyon project had but barely begun, it seemed incredible that so many persons could have business that would take them to the damsite; yet none of the outfits I saw appeared to be only "sidewalk superintendents" or tourists. Visitors of this sort will come later when wind and weather and other factors are more conducive to human comfort. Life at the damsite in December was still terribly real and terribly earnest.

On the north rim of the canyon at the westerly base of a large baldheaded promontory known as The Beehive, I halted my car in a small raw tatterdemalion construction camp. Building of a permanent camp with warehouses, sewage and water treatment plants, streets, fire station, conference hall, residences and the other niceties of civilization will get under way early this year, Wylie had said. Meanwhile, government engineers on the job are living at Kanab and making the 72-mile drive to their work each morning, and 72 miles home in the evening. Rather than submit to this onerous and time-consuming travel, a dozen-or-so contractor's men—a few of them accompanied by their wives—had taken up residence at the damsite. My hat is off to this little vanguard of thousands who will follow. They are pioneers in the fullest sense of the word—the first to send down human roots in this part of the wilderness.

In the camp were four house trailers, battered old veterans that looked as if they might have been used in the Boer War. There were a few cars, the two nearest to me carrying license plates from Idaho and New Mexico. A truck was standing on three wheels and a wooden block. Another truck had its differential dismantled. There were four or five shacks and sheds roofed with corrugated iron sheeting. A few oil barrels were scattered around, and there was a portable tank capable of holding perhaps 1000 gallons of water. There were no trees, no grass—not even any large sagebrush or greasewood. Nothing but sandstone, sky and space. An icy wind was sweeping through the camp with the ferocity of a West Indian hurricane, and powdery red sand was rolling over the landscape like smoke from a prairie fire.

The door of the Idaho trailer started to open, was snatched by the wind and flung back on its hinges with a resounding bang. A woman emerged from inside the trailer and fought with the wind to close the door behind her. With head bent to the gale and skirts flapping wildly about her, she began sealing the cracks around her windows with friction tape. A younger woman came over from a neighboring trailer to help with the taping. It occurred to me that a woman would have to love a man a whole lot to willingly follow him from one construction camp to another.

Reluctantly leaving the relative warmth and security of my car, I headed into the teeth of the wind, following a twisting construction road that led to the canyon's rim, about 100 yards distant. I could hear the motor of an air-compressor chuff-chuffing away in the placid detached fashion of air compressors everywhere; and at the far end of the construction road half a dozen men were working around an A-frame, from which highline cables led across to the canyon's opposite rim.

Breasting the wind, scrambling over rocks and floundering through deep blow sand, I made my way along the lip of the canyon for 300 yards to a vantage point from which it was possible to view a considerable length of the left canyon wall and the cocoa-colored river at its base. Locating a cold but wind-sheltered pocket in the sandstone rocks, I sat down to catch my breath and take stock of the situation.

Composed of massive uniform Navajo sandstone — good material for abutments, Wylie had said—the canyon walls at this point are about 1200 feet apart and rise nearly sheer from the river. The dam to be built between these walls will be of gravity-arch type requiring 5,000,000 cubic yards of concrete — nearly 54 per cent more than was used in Hoover Dam. (Folks with a liking for statistics may be interested to know that 5,000,000 yards of concrete is enough to pave a highway 20 feet wide from San Francisco to New York City.)

At the downriver base or "toe" of the dam, will stand the single power house, 665 feet in length, 112 feet wide and 160 feet high. Here will be housed eight generators of 112,500 kilowatts capacity each. About 6,000,000-acre-feet of the reservoir's capacity will be held as inactive storage below the outlet level for the purpose of sediment accumulation, to protect fish in the lake and to increase the power head. Incidentally, there still seems to be considerable misconception regarding the use to which Glen Canyon dam will be put. Primarily it is for the purpose of generating power. It also will help to regulate the flow of this always erratic river and to protect Hoover Dam from the present heavy infiltration of silt. But its water will not be used for irrigation—not at completion or, presumably, ever.

Studying that long and twisting canyon I tried to imagine how it will look when filled with a clear blue lake. It will be a pretty sight, that is certain—and a strange sight, in this desert waste.

Advent of that great reservoir, naturally, will not be entirely gain. There will be casualties, too. Waters of the new lake will roll deeply over the historic Crossing of the Fathers where the exploring Spaniards led by Father Silvestre Velez de Escalante and Father Atanasio Dominguez forded the turbulent Colorado River in 1776 while returning to Santa Fe after their unsuccessful attempt to discover an overland route to Monterey, California. The Spaniard, Armijo, crossed at this same point in 1829-30. Also inundated will be the equally historic Hole-in-the-Rock Crossing made by members of a Mormon wagon train on their way to settle in southeastern Utah in 1879-80. Undoubtedly, too, the new lake will cover a few rich mineral deposits—there are literally thousands of uranium claims in the land to be flooded—and almost assuredly it will inundate prehistoric Indian cliff dwellings yet undiscovered by archeological science due to inaccessibility.

Whether the colorful river boatmen and river-running parties also will fall by the wayside, remains to be seen. Whether an exit road out of the canyon can or will be provided for them is uncertain. Should it prove feasible to provide such a road, boating parties might embark on the water near Hite on the Colorado, or Mexican Hat on the San Juan, visit the various scenic side canyons and Rainbow Bridge, and then have their cars meet them at a point of debarkation near the dam. But where?

Wahweap Canyon, about a mile

Project Engineer L. F. Wylie, second from left, explains initial construction problems to B. David, field engineer, Governor George Clyde and Senator Arthur Watkins of Utah, from left. Photograph by F. S. Finch, Department of the Interior.

above the damsite, has been suggested for such an exit road. Wylie does not think this will be practical. Although it is true, he said, that a contractor's road is to be built down Wahweap, it will be traveled by trucks highballing through with extremely heavy loads of gravel, cement, steel and other building materials, and since there are places where the canyon road will be very narrow, it positively will not be open to public travel. Warm Springs canyon, also suggested as possible location for an outlet is not feasible due to deep deposits of quicksand, Wylie pointed out. Another tributary under consideration as a possible exit route is Navajo canyon, leading in from the south.

The river, at present, is closed to upstream travel at Lee's Ferry, 16 miles below the damsite; and downriver travelers are not permitted to approach the vicinity of the dam. This latter regulation is not just an arbitrary ruling of the Reclamation Bureau, but a matter of life and death, Wylie said. Due to blasting on the canyon rim and walls, the river area below will be rendered extremely hazardous, for although each blast is preceded by a warning signal, it isn't likely that a boat could be maneuvered out of range in time to escape falling rock and debris.

How the river travel question will be resolved is anyone's guess, but the river boatman is a stubborn, indomitable fellow. He has to be, or he wouldn't survive long in his business. Consequently, it seems safe to assume that the matter eventually will be ironed out in a manner satisfactory to all concerned.

The winter sun that had been shining palely when I arrived at the canyon had receded still farther into the goose-feathery gray clouds that now covered the sky, and the knife-sharp wind had veered a little so that it was now whipping sand into my retreat on the canyon rim. It occurred to me that I wouldn't care to be one of the drillers working in the cage that dangled half way down the opposite canyon wall; nor would I wish to be one of the workmen on the drill barge that rode on the sullen river below; and, most especially, not one of the high scalers suspended from rope's end midway between river and rim along the canyon's north wall.

I remained at the damsite that night, sleeping in my car-bed and eating a cold supper because it was too windy to risk lighting a fire. Late in the afternoon the clouds moved aside for a few minutes so that the sun went down in a blaze of red glory. Darkness descended soon afterward. Two by two and in small groups, workmen returned from the canyon. Some took off on the 72-mile drive to Kanab. Others disappeared into trailers and cabins. A gasoline generator began its busy staccato song and a dozen-or-so small windows soon framed the yellow glow of lamplight. Soon after sunset the interior of my car grew too cold for comfort, and by six o'clock I sought the cozy warmth of my sleeping bag.

The first time I awakened, about three hours later, the generator was silent and the camp was as dark as the dark world spread around us.

Next morning I drove back to Kanab, held another consultation with Wylie and other officials at headquarters, and that afternoon set out for Fredonia, Jacob's Lake, Houserock Valley and the south rim of Glen Canyon. From the north rim, whence I had started that morning, a hawk of even fair ability could have flown to the south rim with one strong flap of his wings; but for me to reach that same point by road meant a drive of 240 miles.

Present take off point for the south rim is at The Gap, an Indian trading post on U. S. 89, 33 miles north of Cameron. For the first dozen miles the road is black-topped—a pleasant surprise—but for the remaining miles it is an unsurfaced sand-road, already treacherous as the result of long smooth stretches broken, with exasperating abruptness, by deep sand traps. Since this is only a temporary route it is to be presumed that it will grow worse rather than better. The permanent route on the Arizona side will break through the Echo Cliffs at Bitter Spring, thereby cutting in half the present driving distance to the south rim.

Even the present route from The Gap to the damsite is not one that experienced desert drivers need fear, and the region through which it passes is more interesting, in my estimation, than that served by the road from Kanab.

After rounding rugged promontories and skirting deep washes for about 40 miles, my road broke out upon a wide plateau—which may not always be as clean, still and peaceful as it was this day. Since there will be many employees at the dam—both during its construction and after its completion—it is a certainty that a permanent city will be founded in this vicinity, but where that city will be situated and what name it will be given are matters still undetermined. When I asked Wylie where he thought this new town should be located he refused to commit himself, but suggested, in an off-hand manner, that I "take a look" at this high mesa south of the dam.

"See what you think of it," he said casually.

Mentally appraising that expanse of country, I saw a place having much to offer a potential town. Embracing hundreds of acres of level-to-rolling land carrying no growth larger than sagebrush, its chief disadvantage would seem to be its complete exposure to the sweep of the wind. By this same token, however, the area is invested with a scenic interest possibly unsur-

passed by any tract of similar size in the region.

Ranging my eyes for 360 degrees around, not a telephone pole or fence post obstructed my vision. Along the west stretched the long fluted wall of the Vermillion Cliffs, topped by Paria Plateau and the snowy conifer-thatched roof of the Kaibab. Glen Canyon's sinuous rock trough formed a deep moat along the north side of the mesa, and to the northeast and east my eyes roamed hungrily over a land studded with towers and pinnacles, laced by deep canyons and spangled with the magic of purple haze and loneliness and far distance. Deep in the heart of that isolated land 30 miles northeast of this mesa on which I was standing, is the magnificent arch of Rainbow Bridge—one of the greatest natural wonders in the West.

Since Glen Canyon dam first was proposed there has been much speculation and apprehension concerning what effect its creation will have upon this loveliest of all the natural bridges. Rumors even circulated that water impounded behind the dam would completely cover the arch! There is no truth in this statement, as anyone must know who has taken time to read the Colorado River Storage Project Bill which provides in Section I: ". . . that as part of the Glen Canyon Unit, the Secretary of the Interior shall take adequate protective measures to preclude impairment of the Rainbow Bridge National Monument."

True, the waters of the new lake will rise in Forbidden and Bridge Canyons, but even when the lake is filled

Desert Awaits Best Wildflower Display in Recent Years . . .

Additional rains plus favorable growing conditions give further evidence that the desert's wildflower show this spring will be the best in recent years.

On the low desert areas of California which generally come into bloom three to four weeks before the high desert, most of the roadsides are lined with green shoots. Dalton E. Merkel, naturalist at Borrego State Park, says the floor of the park is in large measure covered with new growth of annuals. Any of the roads leading into Anza or Borrego parks should provide good viewing locales for the late March and April flower display, he added. The Yaqui Pass road from Tamarisk Grove on Highway 78 to Borrego Springs is expected to afford an especially excellent display.

Apricot mallow was starting to bloom in the arroyos and washes of the Anza desert, reports Lucile Weight who made an extensive trip through the desert regions in February. Verbenas and geraeas were blooming in the Mecca, Valerie and Oasis areas of the Coachella Valley, and east of Holtville, the creosote is in fine condition. Verbena shoots have appeared on the sand mounds south of Whitewater along Highway 99.

Reports all along the ocotillo belt from Baja California north to the high desert indicate that these plants are in exceptionally fine leaf and many are coming into brilliant scarlet bloom at this time (see cover).

O. L. Wallis, supervisor of Lake Mead National Recreation Area, reports prospects for a good April wildflower showing there are excellent. Along the shores of Lake Mojave brittle-bush, creosote and various other plants will be at peak bloom in early April. At Boulder City and the nearby shores of Lake Mead, a profusion of poppies, sunflowers, sunrays and beavertail cacti blossoms are forecast. At the higher elevations the flowers will not appear in great numbers until late April or early May. Mescal, ocotillo, mariposa lilies and various cacti should be among the most abundant, Wallis said.

The best rainfall since 1949 fell over the high desert country, Mrs. Weight reported. By mid-February the annuals were making green patches under shrubs on the northern slopes of the Little San Bernardinos along Twentynine Palms Highway. The Pinto Mountain area (see map page 19) has many annual seedlings showing, with apricot mallow leafing out and great hedgerows of chuperosa blooming in the lower south-facing canyons of that range. Isolated gardens of wildflowers are forecast by Mrs. Weight for the wash and slope areas between Amboy and Ludlow.

Prospects for colorful blossoms are good in the Chuckawalla Valley. Advanced growth is visible along the south base of the Eagle Mountains but rain in the Chuckawallas was spotty, although ocotillo, palo verde and ironwood all are in fine condition on this range.

The Joshua tree blossom show at Joshua Tree National Monument will be extraordinary this year, reports Naturalist Bruce W. Black. The loop road between Twentynine Palms and the town of Joshua Tree will take the motorists through some fine groves.

Mary Beal of Daggett says the wildflower prospect for the Barstow area is most promising. Best place to find displays will be toward the mountains on both sides of the valley. Sheep are grazing in some of the best flower stretches in that area, however.

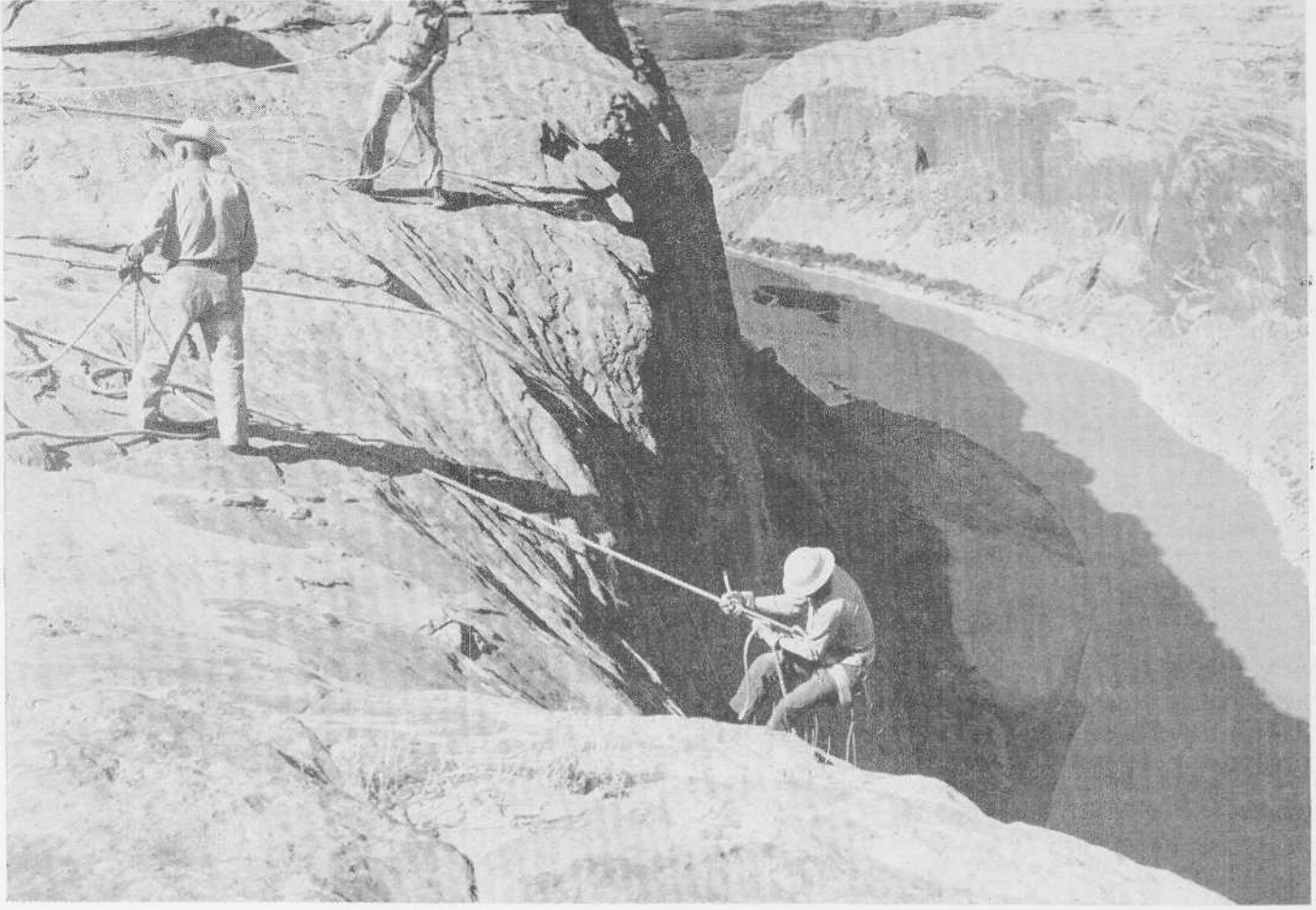
To the west in the Antelope Valley region, Jane S. Pinheiro says Hi Vista area expects April blooms of squaw cabbage, coreopsis, gilia, forget-me-not, aster, primrose and popcorn flower. The Wilsona area also expects displays of these flowers plus several others, including sand verbena and thistle. Mrs. Pinheiro believes lupine, mariposa lilies and other blooms will be found in most sections of the valley. The middle-butte area between Rosamond and Mojave should be well covered with flowers of many varieties and the oak grove road to Tehachapi should make a fine drive for wildflower lovers in late April or early May.

The news from Death Valley is not as encouraging. Naturalist Merdith B. Ingham says this year's display probably will be about the same as last year's. The more common plants blooming during April are phacelia, five-spot, aster, monkey flower, encelia, gilia, creosote, beavertail cactus, mentzelia and gold-poppy.

At Saguaro National Monument near Tucson, Park Superintendent J. Barton Herschler believes April's flower show will be the best since 1952. He expects these plants to bloom during the month: brittle-bush, paper daisy, ocotillo, bladder-pod, owl clover, desert sage, fake morning-glory, penstemon, lupine, delphinium, poppy, hyacinth and evening primrose. Best places to see the displays will be at Picacho Peak and on the Nogales Highway, he added.

Hedgehog, creosote, evening primrose and ocotillo are expected to highlight the blossoms at Casa Grande National Monument near Tucson, according to A. T. Bicknell, superintendent.

John T. Mullady, acting superintendent of the Organ Pipe Cactus National Monument at Ajo, Arizona, says the Sonora desert has a lush greeness following drouth-breaking rains and warm (95 degrees F.) February days. If favorable conditions hold, Organ Pipe may have mass floral displays in April.



High scaler starts over the canyon rim. Photograph by A. J. Randolph.

to capacity, according to Wylie, its surface will be 11 feet below the base of Rainbow's lowest abutment thereby causing a channel of still water 56 feet in depth to occupy the trough of the ravine beneath the arch but not to touch upon it at any point. Thus, it would seem that creation of the lake will enhance the natural beauty of the arch, rather than detract from it.

Leaving the potential townsite on the mesa, I drove downgrade toward the canyon, halting about half-a-mile from the rim when my road dissolved into a vague truck trail which promptly lost itself in a bewildering maze of wind-scalloped dunes and slickrock. Rather than risk getting stuck in the sand or hung-up on a high center, I donned my oilskin slicker—since a cold drizzle had begun to fall—and walked the remainder of the way to the canyon's edge.

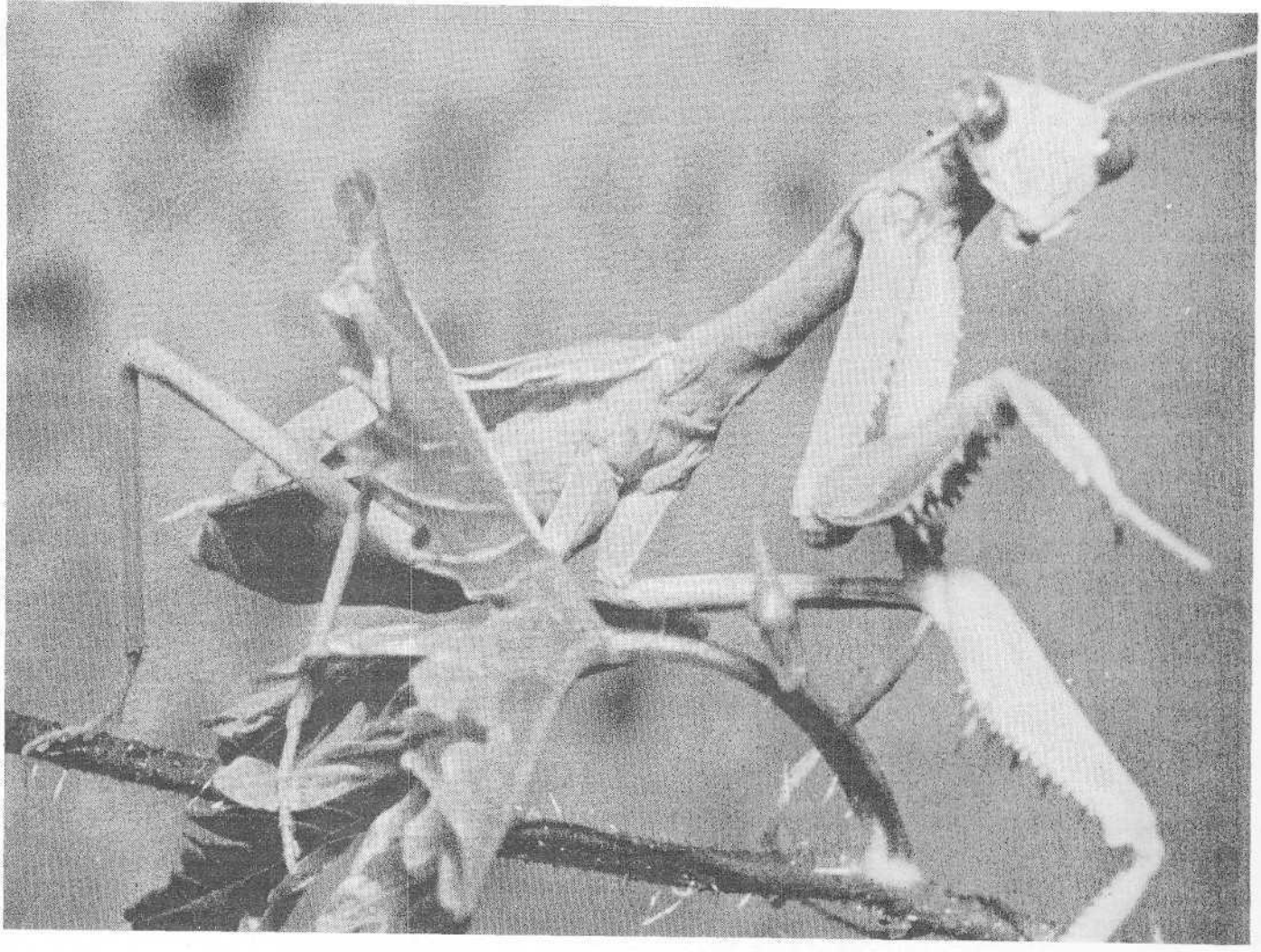
Gazing across the short intervening gap to the north rim where I had been standing 26 hours and 240 miles previously, I saw that not even the inclement weather of this December morning was being permitted to delay progress on the dam. Men were moving around the A-frame, the air compressor was chuff-chuffing impassively, and a dangling high-scaler was chewing at the canyon wall with his pneumatic drill. Result of these several efforts was visibly manifest from time to time when red rock and sand dislodged from the nearly-sheer wall in miniature landslides that slithered quickly and silently into the gorge below.

All work now under way is in the nature of a prelude to the main show, but a year from now should see considerable change in appearance of the damsite. Work, by then, should be completed on the right diversion tunnel, now being drilled through the abutment rock of the northwest canyon wall by Mountain States Construction Co., of Denver. Awarded on a bid price of $2,452,340, the contract calls for a bore 2768 feet in length and from 44 to 47 feet in diameter. After a second tunnel of similar size and length has been drilled through the opposite wall of the canyon, an earthen coffer dam will be built upstream to divert into these tunnels the entire flow of the river, thereby leaving the damsite free of water so the work of construction can proceed.

Watching the dam take form and the reservoir fill will be, to those so privileged, an unforgettable experience. Prior to completion of the dam the new lake will be officially christened, but the name it will bear is yet undecided. Charles Kelly, superintendent of Capitol Reef National Monument, has proposed calling it Lake Escalante in honor of the first white explorer to penetrate this section of the wilderness. The suggestion seems a logical one that should be acceptable to the several states involved, as well as to followers of all political parties and religious faiths.

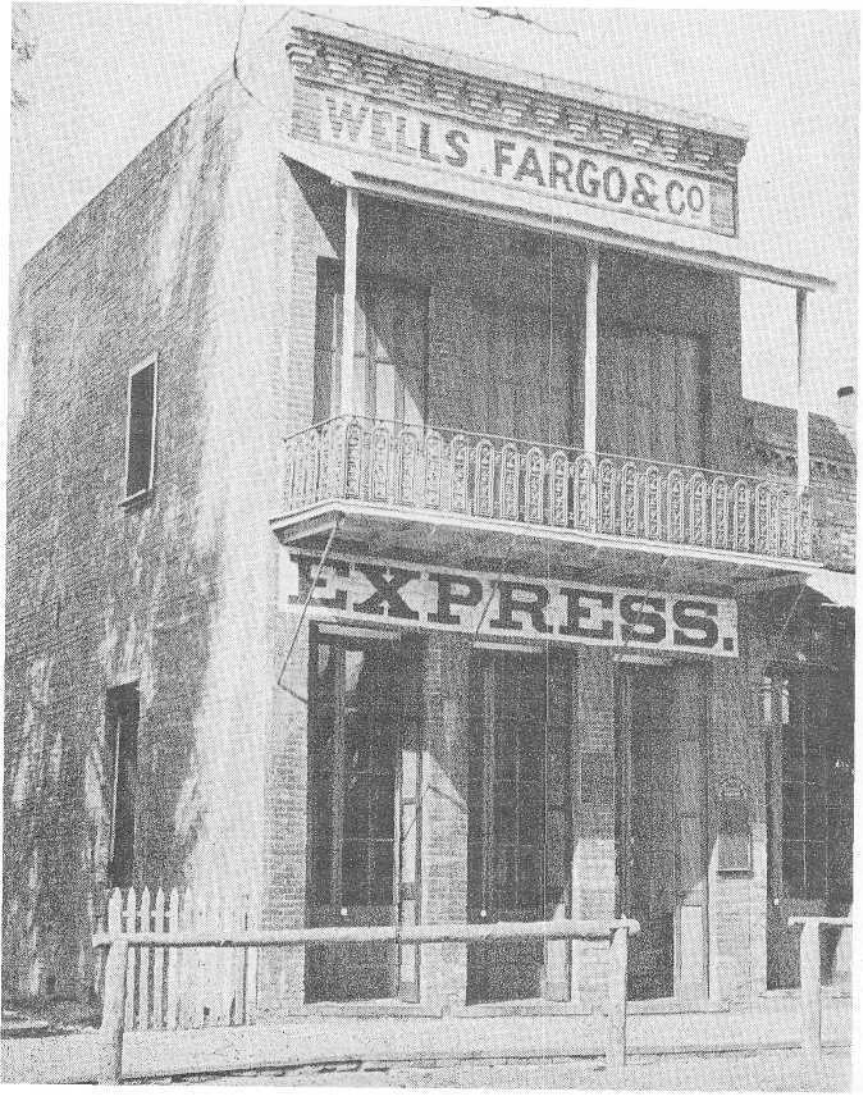
As the new lake pushes back into the many side canyons, its waters will erase forever historical landmarks and places enshrined in the hearts of a few men. At the same time, however, those waters will render accessible for the first time other fascinating places yet unknown and untrodden by humankind. From a recreational standpoint the lake probably will be superior to the river; at least it will lend itself to the enjoyment of more persons. Conversely, this same encroachment by civilization can have but one result—noise and confusion will replace the precious quiet that now reigns over this land, and another slice of the wilderness will be lost.

To every true lover of the desert—and certainly that includes myself—the relinquishment of any wilderness area is a tragic thing that amounts to personal defeat. In the case of Glen Canyon dam, however, I feel confident that whatever loss is accrued will be more than adequately compensated by the gain.



Praying Mantis . . .

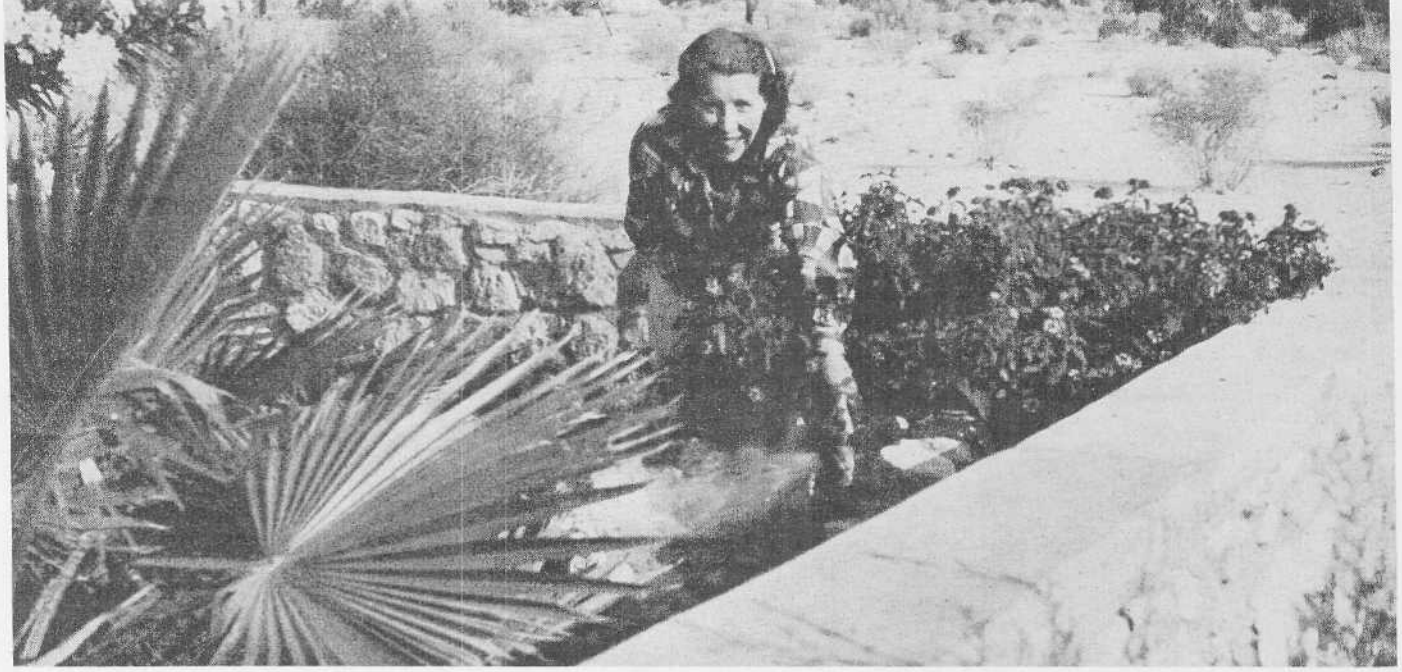
This photograph of a "lion of the insect world" by Dick Randall of Rock Springs, Wyoming, is first prize winner in this month's contest. The Praying Mantis is armed with powerful sawtoothed front legs and a ravenous appetite for animal food. Not even bees and wasps are safe from them. Randall used a 4x5 Graphic View camera, Royal Pan Film, f. 32 with strobe light illumination at 1/800 seconds.



Pictures of the Month

Wells Fargo Office

Columbia, California, is a well preserved state park in the Mother Lode country. Conrad A. Diethelm's photo of the old community's restored Wells Fargo office is second prize winner this month. His camera data: Rolleicord camera, Verichrome Pan film, f. 16 at 1/125 seconds. Diethelm is a resident of Antioch, California.



Cyria's watering job consists mostly of turning on and off nine faucets.

More Garden With Less Water

By RANDALL HENDERSON
Drawings by Margo Gerke

Home gardeners on the desert where the summer sun is very thirsty and the moisture supply limited, have to manage their water carefully. Here is the story of a little domestic water system engineered and built for these desert conditions—a home-made job that converted a town lot into an oasis of shrubbery with a minimum of water.

THREE YEARS ago Cyria and I moved into our new desert home in Palm Desert, California — and that was when plans began to materialize for a little domestic irrigation system which would serve our 116x117 town lot.

We had scarcely gotten the furniture in place and the rugs on the floors when Cyria began to talk about the things she wanted to plant—hedges around the lot, fruit trees in the back yard, vines growing on trellises, stocks to give fragrance to the patio, and a cottonwood or two because she likes cottonwoods.

Cyria loves flowers. My regard for them in the domestic garden is tempered by a very realistic awareness of the time it takes to water them when the summer temperatures rise above 100 degrees, and the high cost of metered water in a desert where the annual rainfall is about three inches.

We must not lose any time, my green-thumbed wife explained, because bare-root trees and shrubs should be planted in the winter. I listened with silent reservations. But I was not alarmed, for we had agreed that we would be our own gardeners. I was sure the task of digging holes, lugging fertilizer and peat moss, building trellises and dragging the garden hose from one spot to another would serve as an automatic brake on her enthusiasm.

But I had under-estimated Cyria's zest for planting things. She became an avid reader of the seed catalogs and instruction books for amateur gardeners. Her trips to the local nurseries became so frequent that I never knew what my home landscape would look like when I returned from my office in the evening.

"But Cyria, don't you realize you'll be spending most of your days watering those things," I remonstrated. "It is only the native shrubs of the desert that can survive on the rainfall."

But I was waging a losing battle—and when friends and neighbors began lugging in bulbs, and vines and shrubs "for Cyria's garden" I knew I was beaten. "It would be discourteous not to plant things when friends give them to us," she explained.

It was about this time that I visited the jackrabbit homestead of Guernsey Close in Apple Valley, California. And there I got the germ of an idea that was to bridge the gap between Cyria's mania for planting things and my aversion to high water bills.

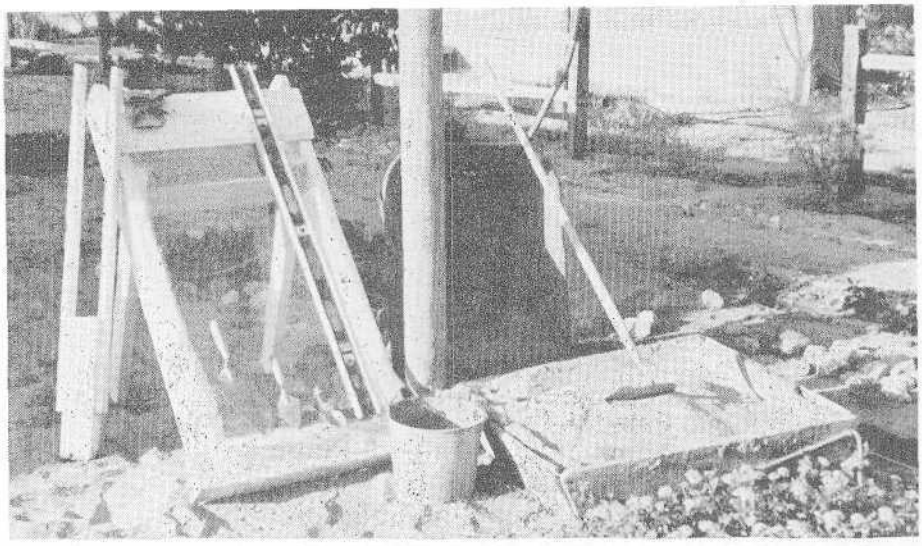
To conserve his water supply Guernsey had constructed some rather crude cement canals from one tree to another. "Takes only half as much water this way," he explained.

I knew at once that Guernsey had the answer to my domestic water problem. Masonry happens to be my favorite hobby, and before I reached home I had envisioned a system of miniature irrigation canals that not only would beat the high cost of water, but would save Cyria many hours of work with her hose every week.

Today our water system is not quite complete—but Cyria's duties as chief irrigator consist for the most part in turning on and off nine hose bibs located at strategic points on our town lot.

When finished we will have 577 feet of miniature canal watering 140 trees and shrubs, and countless flowering annuals in the yard surrounding our home. Cyria has learned her timing so well that she can sit in the patio and read a book while the irrigation is in progress, with only an occasional interruption to turn a faucet on or off. Our water pressure is such that we can run three water lines simultaneously.

Our soil is sandy and the bajada where Palm Desert is located—like most desert bajadas—is so sprinkled with rocks and pebbles of all sizes that materials for masonry construction were no problem. I built a screen with quarter-inch mesh and merely use the sand underfoot for my cement mix—four parts sand to one of cement. Also,



Top—The tools. Home-made mortar box, sand screen and tamper; 5-foot length of 4-inch fiber composition pipe; wheelbarrow, shovel, hoe, level, bucket for measuring sand and cement, 3 trowels and a pair of gloves.

Bottom—Randie Riddell, grandson of the author, opens the 2-inch headgate which regulates the stream flow in No. 6 system.

with scrap lumber I built a 3x3 foot mortar box on a sled, had the tinsmith make a pan to fit it, and tied a rope at one end to simplify the problem of dragging it along as it follows the canal construction.

For molding the canal channel I got a 5-foot length of 4-inch fiber composition pipe. Wet sand molds well, and my procedure is this:

To keep the line true I stretch builder's cord from point to point, and then with shovel or hoe rough in the ditch, using a level to get the proper grade. Then the pipe is seated in the ditch and with trowel the sand is packed against it on both sides. Again I check it with the level. The pipe is removed and cement roughly spread on the bottom and sides of the channel. I use a soft mix, and try to put in enough cement for a wall ¾ to one inch in thickness. Then the molding pipe is laid in the channel again, and to seat it properly I stomp on it a few times. While the mold is still in place I add more cement on both sides and then cap them with rounded wash rocks about the size of a baseball or a little larger. A small trowel and very soft cement is then used to fill in the crevices between the rocks.

With this completed, the mold is removed. To get away from the suction that tends to hold it in place I give it a turn or two before lifting it out.

As a finishing tool for the inside of the canal after the mold is removed I use a little round scoop such as grocers and seedsmen use for scooping bulk contents out of bags. It serves the purpose well.

Some days later, after the cement has dried, I coat the inside with Bondex to make it waterproof. There probably are other patent materials just as good but this happened to be the brand sold at the local paint store.

Where a long line serving many shrubs is required it is a simple matter to make turn-outs into the basin around each shrub; or as often as is necessary for proper watering.

When the line merely extends from tree to tree the canal empties into the basin around the tree, and when this is filled the water flows on to the next tree.

Cyria, who likes to gather small rocks almost as well as grow flowers, has brought in stones for capping around the basin of each tree and shrub, but we do not use any cement in the rims of these basins.

When finished, the canal proper is at ground level, as shown in the accompanying sketch, with the rock capping above ground level.

The level is a very important tool in the construction of these canals. Very little fall is necessary, and I believe such a system could be built on level ground. In places where the natural slope in our ground was too great, I put in little waterfalls at intervals.

Since it hardly is practicable to construct a canal line with 20 or more turnouts that will distribute the water perfectly, the basin around each shrub is lower than the bottom of the aqueduct. Hence the water flows in and fills the basin to the height of the water level in the canal, and then continues on to the next turn-out.

The lawn and some of the flower beds still require hand watering, or a sprinkler, but most of the hose bibs are equipped with double faucets so the sprinkling can be done while water is flowing in the canals. Where the canal passes through the stone parapet wall in front of the house, and under the flagstone sidewalks, I laid short lengths of 2-inch pipe, underground.

Following is the list of shrubs and trees served by each of the nine canal systems; as numbered on the accompanying chart:

No. 1—195 feet in length: 12 oleanders, 6 lantanas, 6 Washington palms, 11 grapevines.

No. 2—47 feet: 2 grapefruit, 2 tangerines, 1 pineapple guava, 1 kadota fig.

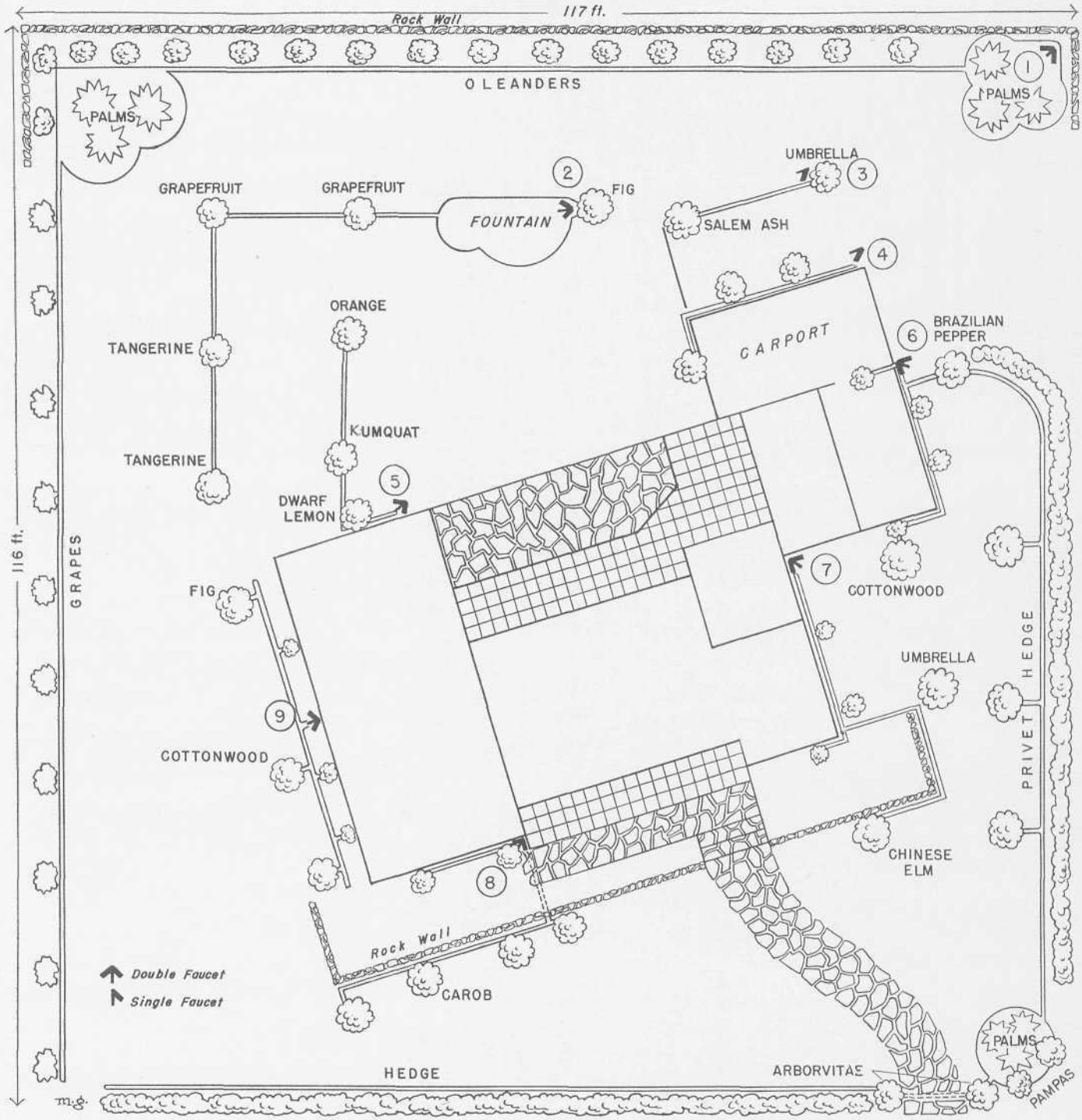
No. 3—11 feet: 1 umbrella tree, 1 Shamel ash, 3 cassias, 10 gazanias.

No. 4—23 feet: 2 snail vines, 1 jasmine, annual flower bed.

No. 5—28 feet: 1 dwarf lemon, 1 orange, 1 kumquat.

No. 6—162 feet: 3 pyracanthas, 1 Brazilian pepper, 1 cottonwood, a hedge of 26 Japanese privets, 1 cassia, 1 trumpet bush, 1 bird of paradise, 1 passion vine, 3 palms, 2 pampas grass, 2 arborvitaes—and a hedge yet to be planted.

No. 7—53 feet: 1 hibiscus, 2 euonymus, 1 umbrella tree, 1 Chinese



Showing the layout of the nine canal lines served by the same number of hose bibs. These trees and shrubs, and flower beds not shown on the diagram, were planted with four goals in mind: lots of shade, ample privacy, a bit of floral perfume, and fruit in season. The interior arrangement of the home, built for summer comfort, was shown in the Desert Magazine of July, '54.

elm, 1 oleander, 1 tecoma honeysuckle.

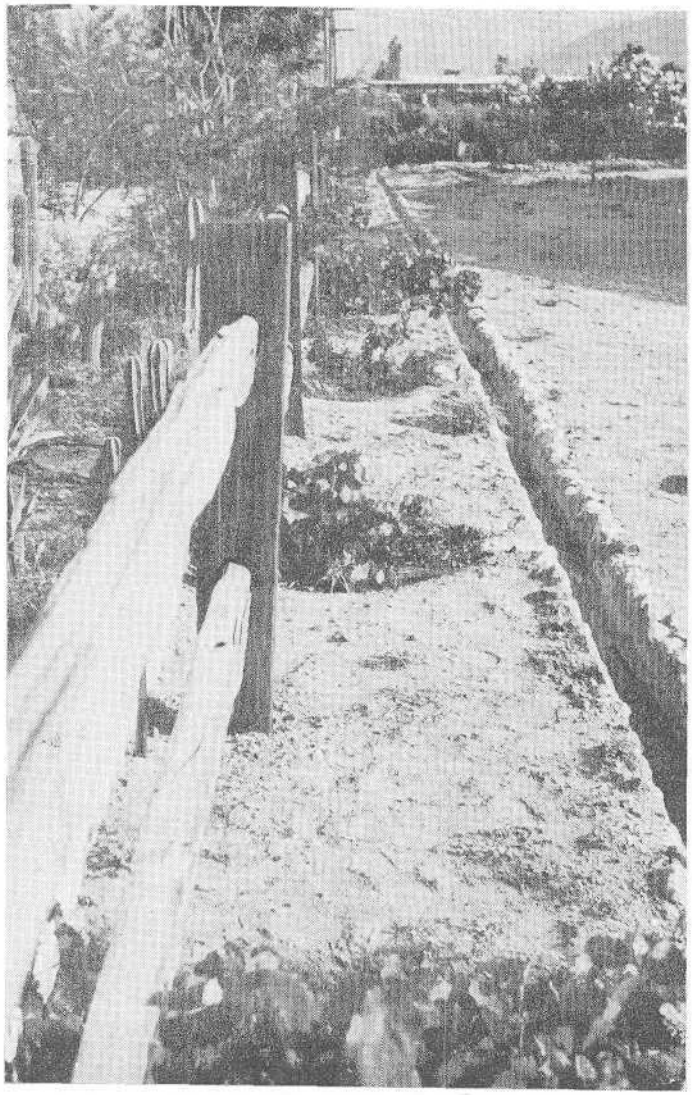
No. 8—36 feet: 1 carob tree, 1 pyracantha, 1 tecoma honeysuckle, 1 catalpa, 1 Rhus ovata.

No. 9—32 feet: 1 cottonwood, 1 brown turkey fig, 1 tropical bird of paradise, 1 hibiscus and a bed of annual flowers.

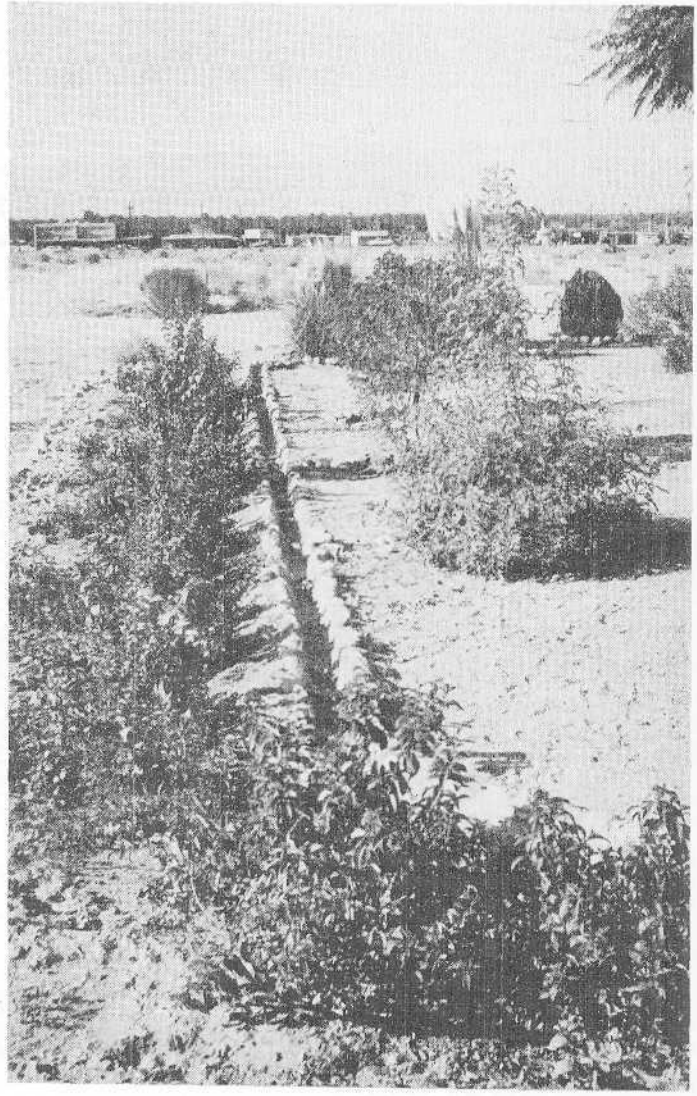
Totals: 577 feet of canal, 140 trees and shrubs and 2 beds of annual flowers.

There is no way of knowing how much we have saved in water bills, but in this porous soil of sand and gravel I am sure that more than half the water which flows in an unlined ditch is lost through seepage. Comparing my water bills with those of neighbors who have similar plantings, I believe the saving is at least 40 percent. Last year our water for yard and all domestic purposes ranged from $3.15 in January to $12.40 in August—an average of $7.57 a month. At our local water company rate this amounts to approximately 4,450 cubic feet of water a month.

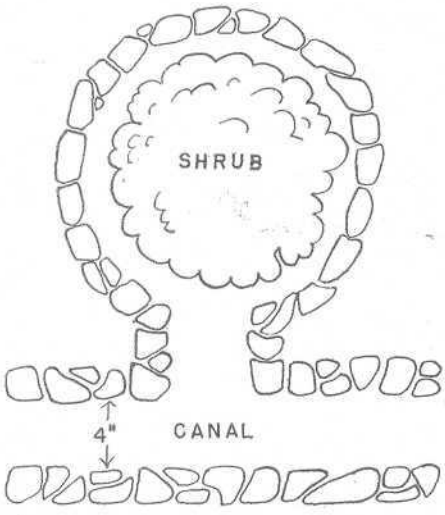
Actually, about 50 percent of this water went into our little patio lawn



Showing canal serving grapevines planted along the rail fence that borders the lot. Turn-outs at every vine.



This canal 162 feet long serves the hedges that border the streets on this corner lot. Privets in foreground.

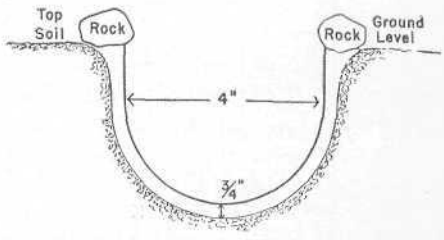


Showing a section of the canal with the turn-out construction at each shrub. There is no cement in the stone capping around the water basin. Native stones were gathered from the desert, and the sand underfoot was screened for the cement mix, four to one.

of dichondra, which was sprinkled almost daily. It was a pretty lawn for two years. Then the bermuda grass moved in and within six months the dichondra had been smothered out.

Our team, Cyria as the gardener and me as the waterworks engineer, got along very harmoniously until we came to that "yet - to - be - planted" hedge across the front of the lot. We've been feuding over that for nearly a year. She wants to plant pyracanthas, and I am holding out for Texas Sage, or Ranger. I've threatened, cajoled, promised, and even tried to bribe her, but I don't seem to be making any headway. Of course I have known all along we would end up with pyracanthas—but I think the male member of the household ought to assert his authority once in a while.

In the meantime our trees and flowering shrubs, all of them planted within the last three years, are paying increasing dividends in beauty and in our knowledge of the way of plant life. Truly there is no greater miracle on earth than the germination of the seed, and the growth and flowering of the tiny sprout that comes through the ground. The little irrigation system does its job very well, but it is a crude and clumsy affair compared with the amazing system of circulation the Creator has devised for even the most humble shrub in the backyard. We are deriving an extra dividend of satisfaction from our little oasis on the desert —because we built it with our own hands.



Cross-section of the miniature canal when completed. Details of construction in accompanying text.

The Virginia Dale's Two Forgotten Towns

Set in the ruggedly beautiful Pinto and Black Mountains of the High Desert of California are the two easily reached locations of the mining town of Dale — both leveled nearly to the plane of the reclaiming desert—both filled with the memories of the past — both sleeping peacefully in oblivion.

By RONALD D. MILLER
Photographs by the author
Map by Norton Allen

Virginia Dale Mine.

THE SUN was swinging low into the western sky as my mother and I followed the Baseline road from the Oasis of Twentynine Palms, California, eastward into the great basin surrounding Dale Dry Lake. The lengthening shadows seemed to accentuate the rugged outlines of the Pinto Mountains and made even more somber the great dark mountains to the east. From the well-paved highway the Pintos are a striking range. They are among the most beautiful mountains in the high desert, largely because of their color—a mixture of deep violets and rich browns. This range, when seen in the evening, often reminds me of a South American travel poster that hung in my room when I was a child. The low sun and a great swirl of cirrus pouring up from the west promised a colorful sunset.

We were taking color slides of our Twentynine Palms region for a lecture series and had at the last minute decided to add the interesting ghost towns of Old and New Dale after we discovered that since our last trip to the area, the Baseline road had been paved.

Today it is hard to visualize this road as it used to be. What was once a collection of ruts and washouts is now smooth pavement extending from Twentynine Palms eastward 19 miles to the ruins of Old Dale.

To distinguish the few remaining relics at Old Dale with the name of "Ghost Town" would be a masterful example of overstatement. It is at this point that the pavement of the Baseline road ends. Another road which goes to Pinto Basin in the Joshua Tree National Monument by way of New Dale branches to the south. At this intersection is all that remains of Old Dale. A rather well preserved cabin forlornly marks the site of the old pump house. The cabin is not much bigger than the water tank that is perched precariously on its roof. The fading letters on the tank spell out "Thornton's Corner." Surrounding the junction in various stages of disrepair are other remains of a once-active gold mining center.

Among these ruins is a well preserved arrastre, a primitive machine for milling ore. However, what it lacks in modernity it makes up in economy. In the early days, the cost of fuel for steam engines became prohibitive. Therefore, a shallow pit was dug and lined with flat smooth rocks. A post was made secure in the center and to this a sweep or boom pole was attached in a horizontal position. To this boom was fastened two large rocks. The economy comes into the picture with the means of locomotion. A burro was hitched to the boom end and driven around the arrastre in a circle. As the two rocks on the other end of the boom were drug over the lining of the pit, the ore was thrown in for processing. A slow but effective method.

A short distance from the arrastre are the remains of a five stamp mill. In 1896, when serious development of the mines in this area began, the mill which had been operating at Twentynine Palms, was dismantled and set up at Old Dale. Later, this arrangement proved too costly so the mines piped water from the Dale and set up their own mills. Since the mines no longer sent their ore to the mill at Dale, and other mines had sprung up further into the rugged hills to the south, the town apparently had outlived its usefulness. But Dale was not ready for death. Everything that did not have roots was moved to a new location about eight miles to the south at what is now called New Dale. The heavy mill equipment did not have roots, but it was set in cement. Perhaps this is why it is still in place.

We returned to the car and started down the road to New Dale which leads south through a pass between the Pinto and the Black Mountains. When taking this route, we always wait expectantly until we round the first curve. Here the traveler is given his first view of the Virginia Dale Mine. This mine is perched on a mountainside and looks as if it is holding on in the fear that it will fall. The tin roofs and buildings glittered in the evening sun. The Virginia Dale is our favorite because we think of it as the beginning of the Dales.

In 1882 two men named Wilson and Lyons left the Oasis of Twentynine Palms to explore the Sheephole Moun-

tains to the east. They found the terrain rugged and had to follow a wash in order to make any progress. While in this wash they discovered some interesting quartz float and traced it to its source. The Virginia Dale was located there.

Lyons and Wilson moved to the site and built a shack from rocks, covering the roof with willow and smoke tree branches. Later another larger shack with a fireplace was built. The fireplace ruins still are standing at the base of the diggings.

The two prospectors kept their discovery a secret for as long as possible, but eventually the news leaked out and a rush started. The trail from Twenty-nine Palms was lined with pack burros, mules and horses pulling wagons loaded with water and camp supplies. Later a well was dug and water found about four miles north of the Virginia Dale. Soon a town developed around this water source and it was called Dale. Thus the Virginia Dale mine was the parent of Old and New Dale.

Three miles farther to the south, the Pinto Basin road is joined by a road to the Ivanhoe Mine. Half a mile up this road is all that remains of New Dale. The site of this once active town is marked by a group of rock foundations along the north side of the road and surrounded by beautiful sepia-shaded mountains. The terrain is extremely rugged and deeply cut by sandy rock strewn washes. It is a melancholy view in the late afternoon, but the grandeur of the surrounding countryside gives a stateliness to the ruins of New Dale.

New Dale thrived during the mining boom and eventually became a company town for the Supply Mine, the most productive mine in the district. At its peak, the town boasted several dwellings, a post office and a saloon. The saloon doubled as a hotel, with guests bedding down in the storage room. No record exists of any business houses or stores, but undoubtedly they did exist.

Various freight companies made regular supply runs to Dale. Their equipment usually consisted of 12 mules pulling a front and trailer wagon. One outfit established by Del Irvine and George Goodsell operated two single-wagon six-mule units. These freighters traveled from Dale to the railroad at Amboy with highgrade ore and returned with coal for steam engines and machinery for the mines. Another route used for the shipping of supplies was the road from Banning to Dale. This was a two day trip with a stopover at Warren's Well in Yucca Valley.

Frank Sabathe ran a stage line from Banning to Dale, and Sam Joyner, at one time the saloon keeper, ran the stage to Amboy. The Concord Coach was used in the early days. This vehicle rested on leather straps strung lengthwise from front to rear axle in lieu of springs. This saved the occupants from a merciless shaking on the bumpy desert roads. The coach seated six to eight people inside and in case of a full load there was room for one passenger beside the driver. The freight boot in the rear, the baggage rack on top and the mail pouch under the driver's seat were all covered with leather.

When the visitor to New Dale looks around and surveys the pitiful remains of a once-lively town, he is faced with the obvious question: "What happened?" The answer is a simple one. Government reports give the total production of the district at close to a million dollars, most of it recovered between 1900 and 1915. But they do not tell how much money was spent to bring that million out of the ground.

The area always has been isolated, with supplies and equipment and labor costly. The mines had piled huge tonnages of ore in reserve, but nowhere could they find a profitable place to sell or treat it. During World War I, the price of labor and supplies went up but the price of gold did not. This spelled ruin for the miners. When the

TRUE OR FALSE:

This quiz is a yardstick by which you may measure the progress you have made in your acquaintance with one of the most interesting regions on earth—the Great American Desert. The questions touch the fields of geography, mineralogy, history, native tribesmen and the general lore of the desert. This feature in *Desert Magazine* each month actually is a school of instruction for those who would broaden their knowledge. Twelve to 15 correct answers is a good score, 16 to 18 is superior. Perfect scores are very rare. The answers are on page 36.

1—Desert wildflowers never grow on sand dunes. True_____. False_____.

2—Free gold sometimes occurs in white quartz. True_____. False_____.

3—Pauline Weaver was a famous woman stage driver. True_____. False_____.

4—Hassayampa is the name of an Indian tribe in Arizona. True_____. False_____.

5—The road-runner never leaves the ground in flight. True_____. False_____.

6—The capital of Nevada is Reno. True_____. False_____.

7—Prehistoric Indians used the pliable switches of the Tamarisk tree for weaving baskets. True_____. False_____.

8—Certain species of desert birds build their nests in cholla cactus. True_____. False_____.

9—Deglet Noor is the name of a date now cultivated in some areas of the Southwest. True_____. False_____.

10—Largest river flowing through New Mexico is the San Juan. True_____. False_____.

11—Bright Angel creek comes into the Grand Canyon of the Colorado River from the north rim. True_____. False_____.

12—Ultra-violet rays of the sun are believed to have caused the fossilization of the petrified wood found in many places in the Southwest. True_____. False_____.

13—Azurite is a copper ore. True_____. False_____.

14—Billy the Kid played a leading role in New Mexico's "Lincoln County War." True_____. False_____.

15—Staple food crop grown by the Hopi Indians is corn. True_____. False_____.

16—Rainbow Natural Bridge is in Utah. True_____. False_____.

17—Agate belongs to the quartz family of minerals. True_____. False_____.

18—Navajos and Hopi Indians speak the same language. True_____. False_____.

19—Hoskinini was a famous Apache chieftain. True_____. False_____.

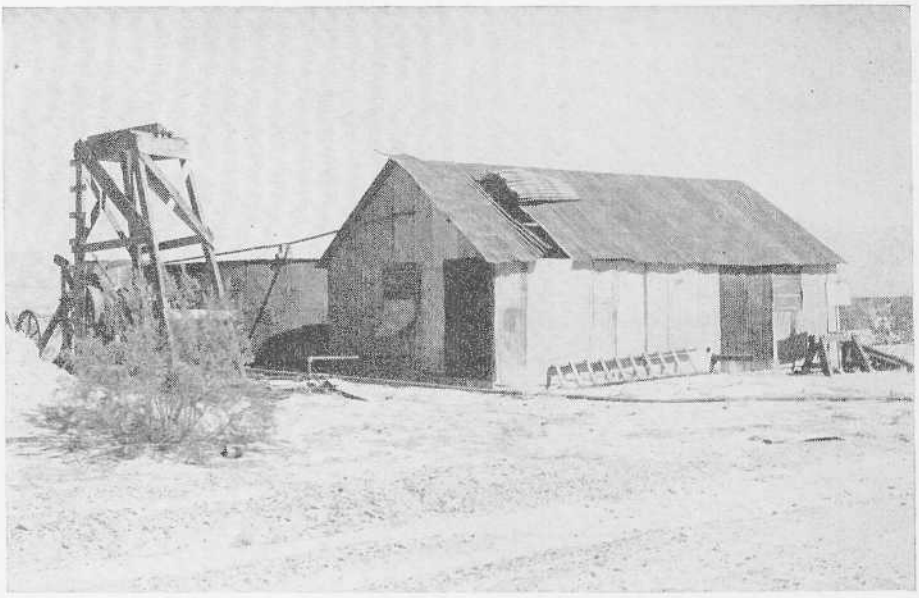
20—From the top of the Panamint Range one may look down on Death Valley, California. True_____. False_____.

Supply Mine closed, so did the town of New Dale.

Dave and Anna Poste of Twentynine Palms went to the Dale District in 1923 to try their luck with the Virginia Dale. When the Postes first saw New Dale, the saloon, the major's house and the restaurant were still standing, but no one was living in the town. The saloon still had the billiard tables complete with balls in the pockets, cues and even chalk. The safe was still in the building. Its door was open, so Dave closed it. The safe was empty, but vandals later blew it open to see if there was any money in it.

The town started disappearing. Vandals destroyed much of it. Pieces of the buildings were taken to patch nearby mine shacks. What wasn't "borrowed" or stolen was broken. The town that had boomed in the '90s was stripped until nothing remained. So it was that when we arrived that evening we were greeted only by gaping cellar-holes and piled stone foundations. Only a mound of stones and broken glass which has turned purple by the desert sun, marked the site of the once noisy saloon.

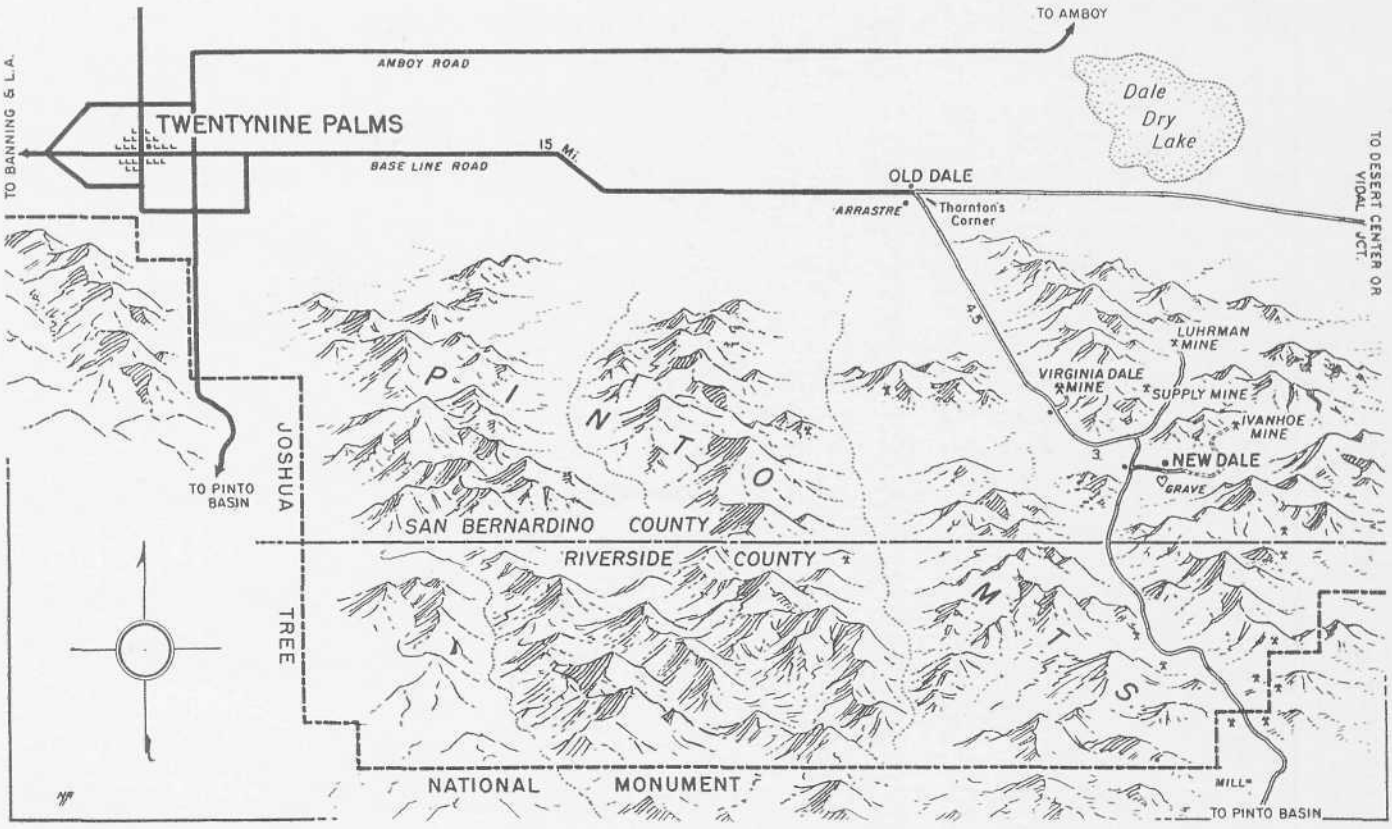
The only other trace of man left at New Dale lies in the sandy cemetery. It is small and heart-shaped and made of marble. It bears the inscription: Carl P.—Son of Percy J. and Adaline D. McCabe—Oct. 17, 1903-Jan. 11, 1904—BABY.



Remains of the five-stamp mill at Old Dale—too expensive to run, too heavy to cart away.

We have never met the McCabes nor have we found anyone who did. However, someone in the district must know them. The grave always is well cared for. It is neatly lined with rock and covered with horseshoes that have been cut in half. We never leave New Dale without a trip to this lone grave. To us, it has become a marker for the grave of New Dale.

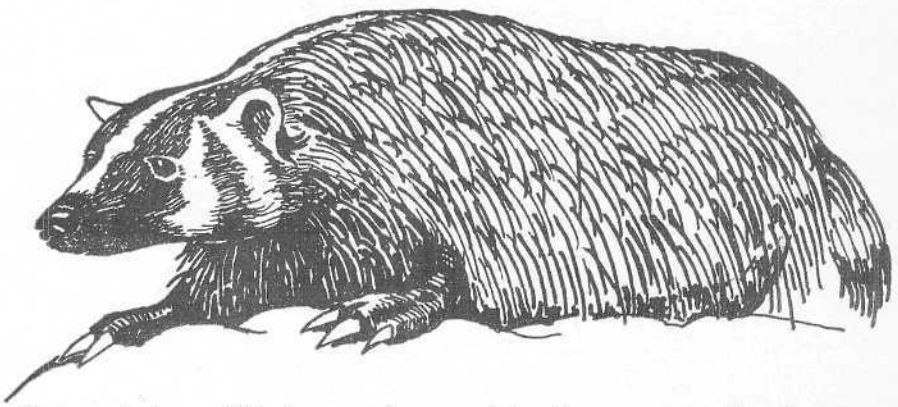
By now, the sun had almost gone. The evening sky was splashed with reds and yellows as the expected sunset materialized over the Pinto Mountains. We looked around and tried to visualize the town as it had been. The modern world has brought changes to the desert. It has brought paved roads, 80-mile-an-hour tourists and five-acre homesteaders. It has taken some things away—but nothing more can be taken from New Dale. It lies quietly, marked only by a grave covered by broken horseshoes.



ON DESERT TRAILS WITH A NATURALIST -- XXXVI

This month Dr. Jaeger takes his readers on a hole-hunting expedition. For it is by the holes they make that many of the creatures of the desert may be identified. Here is a fascinating study for those who would become better acquainted with the strange underground life of the desert region.

By EDMUND C. JAEGER, D.Sc.
Curator of Plants
Riverside Municipal Museum



Western badger. This large underground-dwelling creature digs his own hole. Drawing by Morris Van Dame.

Denizens of the Desert Underworld

LAST APRIL my alert and enthusiastic biologist friend, Jerry Becker of Pasadena, joined me on a five day desert hole-hunting expedition.

Birds, mammals, reptiles and many other creatures leave behind them hints of their presence other than footprints, food remains and odors. Among these evidences are the holes or openings to their permanent or temporary abodes.

At our first desert campsite we marked off a 200 square foot section of typical desert terrain and then counted all the holes, large and small, within this plot. We were amazed at the number—102. Next we identified the animals that made these holes, and some were real puzzlers.

Each hole was the site of some small creature's very earnest labors. Some were mere shallow excavations; others were holes that obviously had been used for very temporary shelters by rodents; still others marked the entrance to the more or less permanent abodes of insects or their lowly relatives, spiders, millepedes and scorpions.

It was easy to tell those which were most recently used. They were clean and well open and often had fresh footmarks around them. The unoccupied and abandoned holes often were ragged-edged and had cobwebs across the openings.

In almost all areas there are numbers of little walnut sized pits in the earth that I call doodlebug holes. They are small and shallow and only mean that some small provident rodents—probably kangaroo rats or white-footed or pocket mice, have been probing around for wind-buried seeds. Rodents are very clever and acute in their sensing of buried food. They seldom dig without bringing up something worth eating, be it an insect or a seed. Some of these seeds they may have cached at some time in the past.

This past autumn while in the arid pinyon country of the San Jacinto Mountains of California, we became aware of the extraordinary diligence and thoroughness of rodents in seed gathering and storing.

Last year was a good pinyon-nut year, as the Indians would say, and when late September came the branches of the pinyon trees, heavily laden with cones, were everywhere yielding great quantities of the delicious fat nuts. When the cones split open many of these nuts spill on the pine needle carpet beneath the gnarled old trees. One can pick up many handfuls in a very short time. In places the ground was covered brown with nuts. Yet, three weeks later when we returned, not a pinyon nut was to be found.

The rodents had completely cleaned them up and carried them away to their underground domiciles. Pinyon jays got a few to be sure, a very few were gathered by man, but most of the million-ton crop was taken by the prudent circumspect rodents — pack rats, white-footed mice and ground squirrels. Yes, rodents are frugal hard working creatures. Their little paws are almost constantly gleaning the seeds that man and most other larger mammals neglect or despise.

The most common larger holes we saw on our hunt were those made by the several kinds of widespread and abundant kangaroo rats or dipos as they are sometimes called because of their generic name, Dipodomys. The large excavations were made in the loose sands by the Big Kangaroo Rat (*Dipodomys deserti*). The extensive galleries of this handsome long-tailed and soft-furred rodent often caved in beneath us as we walked over the hole-covered sands. Often we noticed the main gallery entrances were neatly plugged with sand to keep reptilian intruders out.

In places we came upon colonies of holes of the smaller kangaroo rats made in clay soils at the bases of creosote bushes and mesquite trees, even sometimes in stony stretches of the upland mesas.

Once we entered a badger's territory. We found not only the large wider-than-high main opening to the underground hide-out surrounded by its large piles of excavated clays and gravels, but also many other holes, some of them pretty large and extensive. These latter had been made by the badger as he dug out rodents which constitute his chief fare. Most of these hunting holes had been made at night and were extensively distributed over the badger's big territory. This handsome flat-bodied quadruped has a huge appetite and must find many small or several medium-sized mammals, such as gophers and ground squirrels, each night to appease his hunger. It is this compelling appetite for burrowing rodents that makes the shy, retiring and inoffensive badger such a valuable ally to the farmer and stockman.

Next day we came across the den of a little family of spotted skunks. The odor made identification unmis-

takeable. The gallery had been dug into the side of a steep wash bank just beneath a large round rock. On the soft earth below the entrance were many impressions of flat-soled feet.

On a broad sandy mesquite hummock far out on the desert flats we saw not only numerous den openings of large kangaroo rats, but several openings to the daytime homes of kit foxes. The two always go together for kangaroo rats are the chief food item of the kit fox.

The kit fox often appropriates the diggings of these rodents, especially when a den is being prepared for its young. These it enlarges sufficiently for its own needs.

We saw many impressions of the small kit fox in the dipo-inhabited sands as well as several places where attempts, often successful, had been made to dig out dipos from their subterranean retreats.

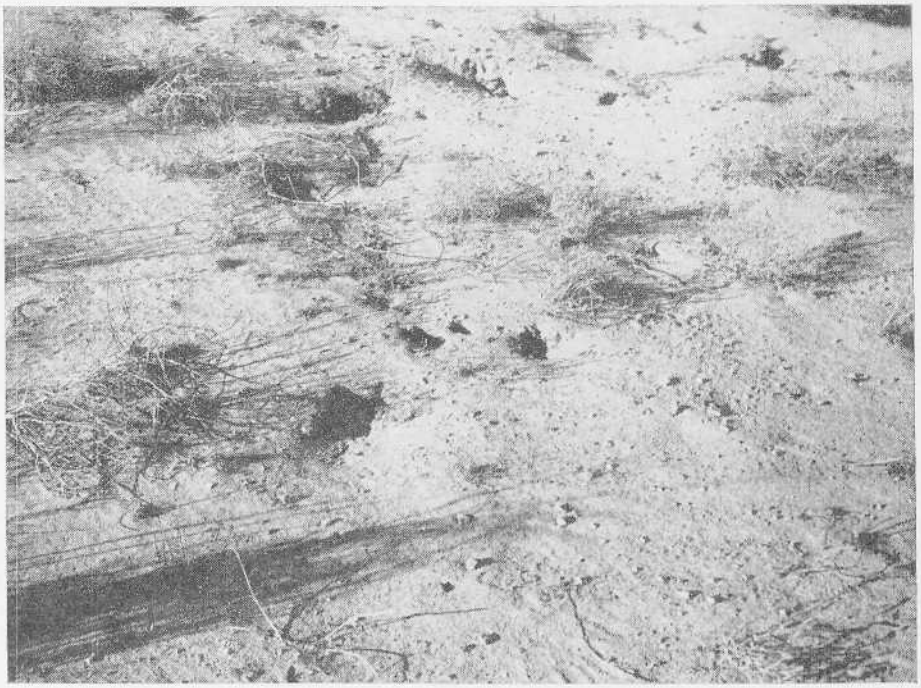
On a brush-covered semi-clay flat we saw an antelope ground squirrel run for its hole. Down he went into an inch-and-a-half opening just beneath a cactus. This chipmunk-sized rodent is easily identified by the way it carries its tail back over its furry side-striped body. The tail is white underneath and fairly flashes as he bounces along.

This particular squirrel chose to make his hole under that thorny-branched plant with its strong shallow-surfaced roots because it will help keep predatory animals from digging him out. We noticed that the tunnel did not go straight down, but was dug at an angle to the surface. Nearby, under a creosote bush, he had an escape door. Although an antelope ground squirrel goes some distance from its home hole, it seems to keep the location well in mind for when unduly alarmed it runs quickly and directly to it.

Later that day we found a little mother ground squirrel with several fuzzy-haired half-grown young playing about in a thicket of bladder-pod bushes. As we approached, the solicitude of the parent for her young was immediately manifest and we saw her set her juvenile charges a good example by almost instantly scurrying to cover.

She slipped into a small inch-and-a-half round hole rather well hidden by the thorny branches of a lycium bush. The young, at first less cautious, played around a few more moments, then precipitously followed her into their underground domicile. We waited very quietly for 20 minutes before we saw a little bright jet-eyed creature with fuzzy head reappear at the opening. Ten minutes later this cautious youngster came out into the open.

Another common type of hole on the desert floor is the finger-sized opening. Those that go straight down most likely mark the sites where adult beetles have emerged after finishing their inactive pupal life.



The desert floor pitted with holes of the big Desert Kangaroo Rat. Photograph by the author.

There are many millepede and spider holes. The latter are easy to identify because they are lined with webbing or a combing of leaves or sand held together with webbing at the entrance.

A near relative of the trap-door spider of coastal California builds in desert sands and gravel a very conspicuous protective wall or curb about the opening to its underground home. These are particularly noticeable in autumn. By excavating one we found that the hole led directly down 18 inches and then turned slightly. In the lower part of the tube we found the rather large gray spider. Just what purpose is served by the curb at the entrance I am not certain.

In the gravelly soil of a mesa we found several habitations of the big brown-haired spiders called tarantulas. Some occasionally dig their own burrows but those we saw evidently had

Spotted Skunk often uses holes dug by other animals, adapting them to his particular needs. Drawing by the author.

been appropriated from rodents. The tunnels always are loosely lined with silk and the entrances are neatly rimmed with webbing.

On the face of a steep clay-sided canyon I pointed out the work of other diggers. The small holes were made in the unbelievably hard soil of the vertical canyon wall by mason bees.

First they soften the clay with saliva and then bit by bit remove the wet soil. The near pencil-sized completed tubes, from an inch to an inch-and-a-half deep, had upon completion been provided with nectar and pollen and the egg layed thereon. Then the openings were sealed with wax so that they were quite invisible until the adult bees emerged. After the eggs hatched the larvae ate the pasty mass, turned to pupae and then reached adulthood. These bees sometimes work in large aggregations and then the holes which puncture the bank are in such numbers that it figuratively resembles the top of a huge pepper box.

Despite popular belief, snakes seldom live in holes. They sometimes enter holes to escape a pursuer or to hunt food. Don't worry about a snake coming out of a hole to bite you. Parents should teach this to their children. Furthermore, they should tell them that snakes do not dig holes in which to hide.

On the fourth morning of our hole hunt we came upon a johnny or burrowing owl habitation. I knew it instantly, for about the sides of the wash-bank entrance were numerous bone-and-hair pellets—the rejectamenta so common about owl habitations of all kinds. The birds were not at home or else were resting below ground, for we saw no sight of them although we watched nearby for some time.

The desert jack rabbit, really a hare, does not occupy holes but his near relation, the cottontail rabbit, like all true rabbits, does. In these they not only often spend daylight hours, but here they give birth to and later rear their young.

One opening to a cottontail burrow we found under a burro bush was about five inches across. The rabbit may have dug it, but chances are it adapted for its needs a burrow previously dug by some other mammal, probably a ground squirrel. Cottontails generally have an extra outlet or two for escape should a snake or furiously digging predator enter the underground galleries.

Many indeed were the holes of scorpions we saw. At times there were so many, all looking quite fresh, that we almost concluded that scorpions were the most common and most numerous of creatures that sought shelter underground. The scorpion's hole is unique. If you see a small wide, flattish hole leading underground at only a slight angle, and out before it a long fanlike carpet of debris, you can be certain that this is a scorpion's dwelling place. The tube is excavated to a considerable depth and because it always is made in loose textured soil which easily caves in, it is hard for the investigator to follow. The hiding scorpion may be found even up to a foot or more beyond the entrance. The burrow is made at night—often a new one each night, but sometimes a scorpion will occupy his den for a number of successive nights.

Hole hunting on the desert can be a fascinating pastime and points up the fact that you can learn much more on exploration trips if you concentrate on one or two particular phenomena when studying Nature.

Historic Panoramas II

The Hole in the Rock

By JOSEF and JOYCE MUENCH

An impressive cavalcade of 80 wagons, 200 horses, 1000 cattle and 250 men, women and children pushed through this narrow slit of rock in the walls of Glen Canyon and crossed the Colorado River in February, 1880. Never used as a crossing before—or since—the Mormon party spent weeks building a road to the rim, blasting and making a remarkable trail down through it.

There was perhaps no wagon trek in history more difficult than that made at the command of the Mormon church to proceed from the Utah towns of Panguitch, Kanab and Henriville to found Bluff, on the San Juan River. Only a group fired by religious zeal could have made it. They first worked their way through a flat region with almost no water, feed for stock, or even fuel for fires—then down the widened "Hole in the Rock," across the formidable river and on for more long months through the rugged canyon country. Visitors to the scene of their struggle still wonder at the achievement.

Upper photograph, opposite page—

Hole-in-the-Rock. Looking from part way down, through the cut which leads from the rim of Glen Canyon to the Colorado River below. Over this almost impossible route, 250 Mormon Pioneers went, across the stream and up through another cut seen in the middle distance, to found Bluff on the San Juan River. They spent six weeks building a "road" to enable the wagons and almost 1000 head of cattle to make the 1000 foot (one and a half mile) descent to the water, in 1880.

Lower photograph, opposite page—

Mormon Steps at Hole-in-the-Rock. Although they were cut in 1880, these steps still show clearly what great difficulties the 250 Mormon Pioneers faced in getting their wagons and 1000 head of cattle through the rocky cut in Glen Canyon.

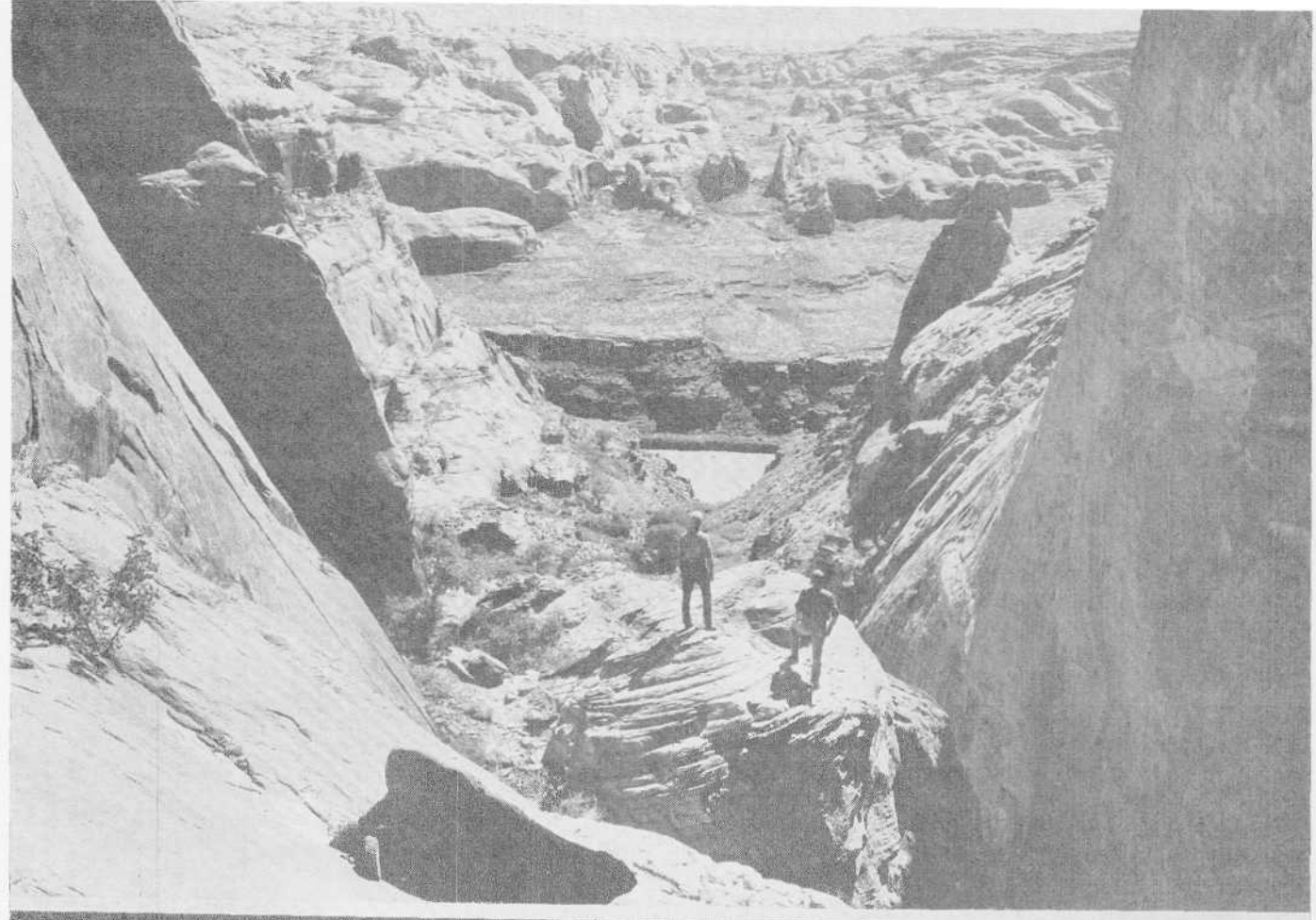
THE Desert MAGAZINE

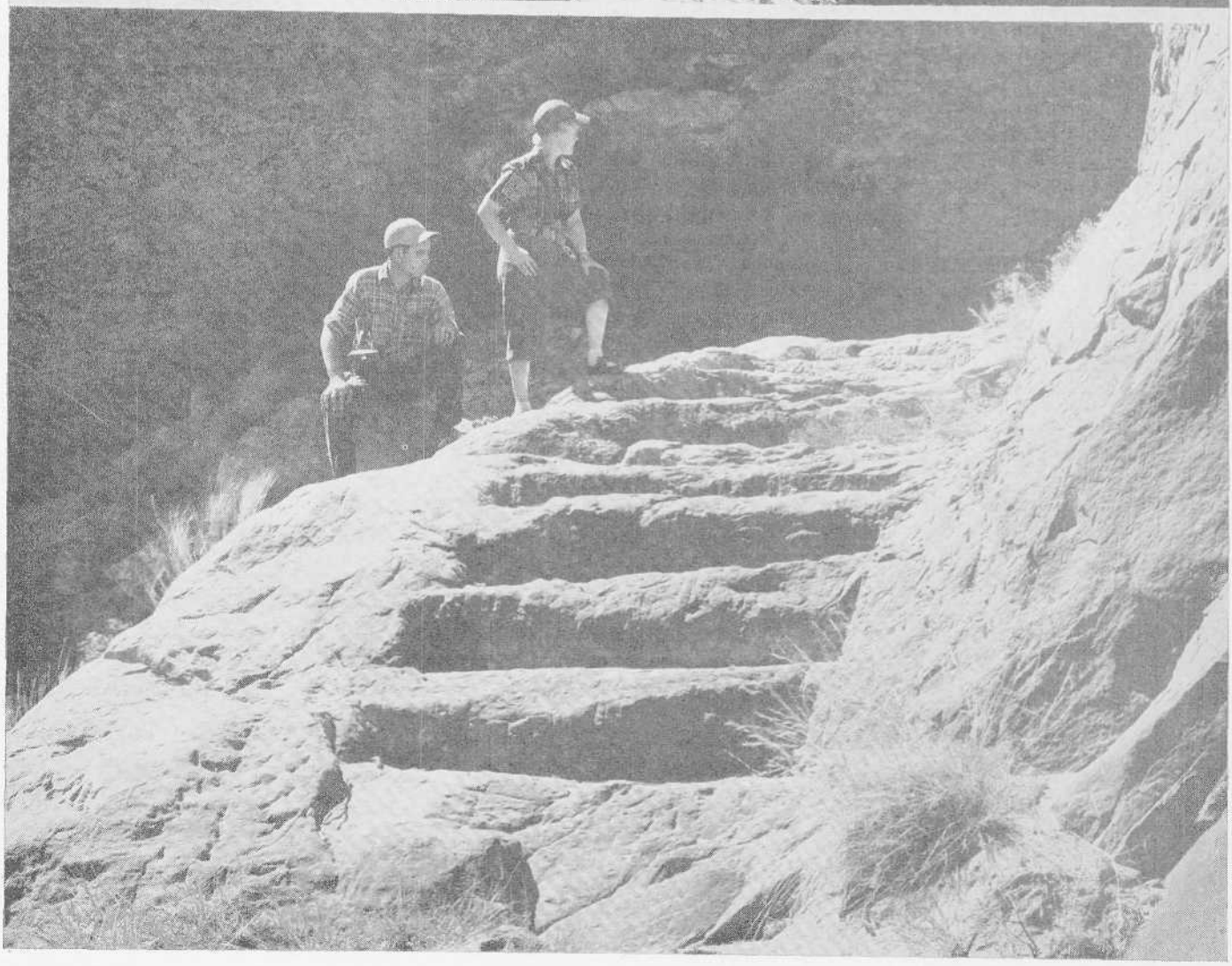
CLOSE-UPS

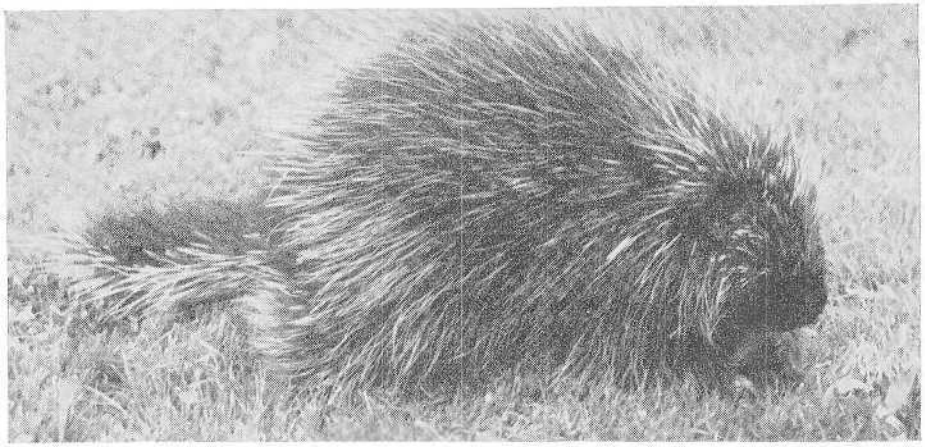
"The Virginia Dale's Two Forgotten Towns," the ghost town feature in this month's *Desert,* was written by Ronald Dean Miller, a school teacher at Twentynine Palms, California. For the past three years, he has worked weekends as information-receptionist for the National Park Service at Joshua Tree National Monument.

Miller was born in Eureka, California, in 1928 and studied at Stanford University where he majored in dramatics. He has been teaching for the past five years, with a short time taken out for army duty.

In his spare time he pursues three hobbies: writing, photography and painting.







The porcupine—Erethizon dorsatum—is a large rodent which feeds largely on bark and leaves. Photograph courtesy U.S. Fish and Wildlife Service.

Water from a Cup to Save Porky's Life...

The dying porcupine had no reason to trust these two-legged creatures, members of the Animal Kingdom's most feared and ruthless predator species—but Porky drank the water they offered providing an interesting lesson in the ways of Nature.

By JUNE HAINES BETSWORTH

THIS LITTLE guy had courage—and brains—the character we found dying in a desert waste, 40 miles from Albuquerque, New Mexico, last summer.

Our jeep wheels had lost all hint of trail 16 miles back and we were crossing a sand bed barren of all vegetation. The sea of sand was burning under the July sun's 105 degrees.

Ahead in the far distance we saw the jagged bushless outline of the black volcanic boulders where we were going to search for gem stones. Near the road basked a few tilted fence posts, reminders that this area had seen wetter days when cattle fed on now-absent forage.

And there he was! Standing immobile with his front paws braced against a two-by-four post. His mouth was agape. Glazed eyes watched us from his little rabbit-face. The noisy jeep motor must have terrified him, yet he did not move when we pulled alongside, straining to see what creature could possibly be so many miles from vegetation and water.

Perhaps he could smell the water we carried in the jeep cans. Or maybe it was sheer bravery instilled by an intelligence that caused him to know that to move away from those two inches of shade would be an even surer death than taking his chances with this noisy red monster bulging with human beings.

We stopped. My husband and our two little girls stepped out. We were sure now. It was a porcupine!

As we edged closer, he slowly turned his furry-gray face towards us. He loosened his grip on the fence post, but hesitated in an upright position. This mid-air pause was the sluggishness of dehydration, but it looked as if he were begging with his tiny outstretched paws.

We moved closer. Porky seemed to give up hope and came down on all fours. He began a resigned painful turn to menacingly wave the long quills of his back at us.

George, my husband, motioned for us to stop. He filled a tin cup with water and started toward Porky, talking quietly. The porcupine waited. Finally he again turned his back to us. George crept forward holding the water in front of him at arms length. Would Porky at the last second bolt off across the desert in a final death-spasm of energy? Or would the fragrance of moisture in that sizzling sand-sea momentarily subdue his fear of man?

Closer and closer the cup of water came to Porky's mouth. George was within a foot of the animal. He set the cup down and backed away. Porky eyed it without moving. Then George picked it up again and dropped to one knee. Porky swayed and attempted a clumsy turn-around with his friendly-end facing George.

The distance between cup and mouth narrowed to inches. Suddenly it happened. Porky could stand it no longer. Up came his little front paws. The finger-like claws reached out frantically and pulled George's hand to his mouth and Porky drank with his chin submerged in the cup, holding George's hands like a baby grasping its milk bottle. So eagerly did he go after the water, a steady stream trickled down his jaw. In such a manner he emptied cup after cup. We watched in amazed silence. The desert had again met its match and lost a victim. Plucky Porky's courage and reasoning power had triumphed.

But Porky was not yet completely out of danger. The worst crisis had been met, but, if we left him here could he make it back to greenery in his weakened condition? (We never did solve the mystery of his being out in the middle of nowhere!) We had to take him with us! With no equipment for catching or carrying an animal, much less a porcupine, it would be a job.

The remainder of the afternoon was spent in getting Porky into the jeep. After much difficulty, including several quill wounds, we placed him in an equipment box. It was my duty, as George drove, to keep the "head end" open for air and the dangerous "back end" covered. The quills had only to graze the skin to penetrate. Tiny barbs made extraction difficult and painful. Contrary to the still prevalent belief of many, porcupine quills are not shot out by the animal.

My arms ached before the two-hour ride ended at a beautiful green thicket on the banks of the Rio Grande near Albuquerque. Porky turned often in the box, and each time he did I would have to close the quill-end and open the head-end. We poured water over a blanket to cool off his cramped quarters.

Among the reeds and river plants that grew under the cottonwoods at the river's edge, we said good-bye to Porky, but not until he had drunk quite a number of additional cups of water. We lost count of the exact number, but estimated that he had taken close to four quarts of water that afternoon before he ambled off, somewhat livelier than when first we met him, into the bushes.

HOME ON THE DESERT

Citrus Fruit In Your Desert Garden

You may have both perfume and delicious fruit in your desert dooryard—if your home is in one of the zones where the air currents are favorable. Here Ruth Reynolds tells about the varieties of citrus trees which thrive in Tucson, Arizona—and in most of the desert regions.

By RUTH REYNOLDS

Large fruit-laden kumquat tree on the University of Arizona campus. Kumquats are almost ever-bearing and often are grown as dwarfs. Photograph by Helen Gardiner Doyle.

APRIL COMES with a grand flourish to the desert garden. Mornings dawn to the accompaniment of bird song and the scent of flowers wafted through my open window. The birds, at least a hundred strong—set up a great before-sunrise clamor from the loquat tree and I sleepily request them to be off or be quiet. Should they ever do either I would be a very disturbed and remorseful woman, but secure in the knowledge that they will pay me no heed, I doze peacefully until it is time to get up.

Soon after sunrise the birds feed quietly and flower fragrances are dissipated as the air—slightly humid by night—becomes desert dry again.

But early and late, April is, gardenwise, the month we live for on the desert. There is so much to be enjoyed. Our gardens glow with annuals planted in the fall and hopefully tended throughout the winter. Roses bloom, and iris. There are flower shows to attend and club-sponsored garden tours to be taken during which one may wander through numerous oases of enchantment.

And there is work to be done in April.

With the heavenly scent of my neighbors' orange blossoms drifting over the wall, and with visions of many lovely citrus tree-enhanced gardens fresh in my mind, nothing appeals to me more or seems more timely than the planting of a citrus tree or two—or three. Where the danger of frost is not yet past it may be a little early for planting, but plans and preparations surely should be started.

Citrus growing in the Southwest is restricted largely to the valleys and mesas which comprise the most typically "desert" areas of this region. The higher plateaus are too cold. The low mesas are almost ideal. There citrus fruits are grown commercially and as common dooryard trees.

Between these extremes are areas where citrus trees are grown very successfully with care and planning. The Tucson valley, with a mean annual temperature of 62.2 degrees and a growing season of 250 (frost free) days, is such a middle ground. But even within the town there are climate zones—some more favorable, which is to say warmer, than others.

Were it not for the orange and lemon trees just beyond our wall and thousands of others all about town, I would have qualms about planting citrus trees on our premises, for we do not live in one of the more frost-protected sections of town. This I have long supposed to be true but have only recently found confirming statistics—along with much other valuable information—in *The Climate of Arizona,* Experiment Station Bulletin No. 279, by H. V. Smith. You can obtain a copy by writing to Agricultural Experiment Station, University of Arizona, Tucson, Arizona.

Besides pointing up the drama of climate—the wide range between day and night temperatures and the sharp contrasts where desert and mountain meet at the same latitude—the publication demonstrates that the lowest elevations are not always the warmest. Tucson's cold zones are found along river beds and draws where cold air currents flow down from the slopes above, dropping temperatures two or three degrees lower than in the rest of the valley.

Where the foothills begin there are frost protected areas which, although higher, are sometimes from five to ten

degrees warmer than the colder zones of the valley floor. One such area eight miles from downtown Tucson is a thermal belt of over 200 acres containing some of the southwest's finest citrus groves, chiefly orange, grapefruit and tangerine. A few lemons are grown but they are less cold hardy and a greater commercial risk.

Many varieties of citrus grown there and chosen for quality of fruit, cold hardiness and general adaptability are recommended for the desert garden. Properly planted in the most sheltered space available and kept healthy with sufficient water and fertilizer, they will yield delicious tree-ripened fruit—as well as fragrant blossoms. And they are, of course, among the most ornamental of trees.

Among citrus varieties for the garden, oranges are most frequently chosen. However it is only within recent years that any except the sour Seville (*citrus aurantium*) have been at all widely planted in our valley. Impervious to our coldest weather, these hardy trees ornament many a patio, beautify residential streets and border the parkway before the railroad station—to catch the eye of all visitors arriving there.

The fact that the fruit is not edible from the tree makes them all the more useful for avenue planting. The oranges are too sour to tempt passers-by but, home grown, they may be used to make orangeade, orange pie, cake or marmalade — all with a delicious orangy flavor and lemon tartness.

The ease with which this variety grows probably has given impetus to the growing of edible fruit varieties. There may have been many newcomers who, like our neighbors, were thrilled by the orange trees and not knowing any better, insisted on sweet oranges—to have them turn out just fine. Of course a great deal of research and experiment actually have brought edible varieties to the garden.

The Washington Navel is the most popular eating orange. The Cardinal, with its red skin and pink juice, is both an eating and a juice orange. The commercial juice orange, Valencia, tastes better off the tree.

Diller and Hamlin bear excellent fruit and can stand considerable cold, requiring protection only during unusual cold spells when the trees are young and tender. According to the University of Arizona's citrus growing bulletin, oranges on mature trees require protection when the temperature is expected to be below 26 degrees for periods of two hours or longer. For commercial groves they recommend irrigating and wind machines, but for a dooryard tree a string of Christmas tree lights is effective. Lemons and tangerines, being smaller, require less time to freeze and need protection when temperatures are two degrees higher. Conversely, grapefruit stands a little more cold. Citrus blossoms and new spring growth are in danger when temperatures fall below 28 degrees.

I pass this information on parenthetically, to forewarn and guide the gardener planting citrus trees. But the point is that little protection may ever be necessary if the trees are planted, as they should be, with a sheltering wall to the north of them or, better still, in the corner of a courtyard enclosed or partially enclosed by walls of the house.

Now back to adaptable varieties. Grapefruit recommended for the garden include Marsh Seedless and various seedless strains having a pink flesh and a red tint to the peel. Redblush, Cardinal and Ruby Blush are favorites and have exciting eye-appeal as well as taste-appeal.

Among lemons the Meyer (dwarf lemon) has long held first place but last summer it was condemned as a fruit virus vector which should be banished from the garden and the grove. Our neighbors' lemon is a Meyer and bears wonderful fruit. It is really amazing how aromatic and tempting even a lemon fresh from the tree can be.

With the Meyer off the market perhaps the Pondorosa will supplant it. This is a decorative tree with large flowers, large leaves and fruit. Like the Meyer, it can be espaliered. Eureka and Lisbon do well but their fruit is more ordinary.

Newer and to many people more desirable are the unusual and interesting varieties of limes which may be available to gardeners. Rangpur and Otaheite are among the most frost resistant.

For the unprotected garden there are Mandarin type oranges: frost resistant tangerines, tangelos and new hybrids worth shopping around for. And there is still the sour orange which grows as far up (5000 feet) as Warren, Arizona. There is also the kumquat with small oval fruit for eating or making into jam. I cook seeds, skin and all and skim off the seeds—which rise to the top — before adding the sugar.

The Calamondin—not well known —is very hardy. Its small orange-like fruit is not for eating but makes the best jam of them all. The tree is ornamental and being ever-blooming and ever-bearing is also never-failing. It is, I think, our tree of the future though I have seen only one full grown.

Usually citrus trees should not be pruned beyond the removal of dead wood, if any, and suckers in spring. They were meant to wear their skirts long and the best fruit is often on the lower branches where it is best protected.

Actually the trees' best protection—after all other conditions have been made favorable—is water. Water to maintain healthy growth the year around and to fill their tissues to capacity during the coldest weather. A dehydrated tree suffers most from freezing. As the leaves and twigs thaw they dry out and die, with the normal flow of sap checked and transpiration going on.

Where no freezing temperatures are feared, gardeners might like to try "The New Irrigation Plan" for commercial orange groves explained, in Progressive Agriculture, by R. H. Hilgeman who states: "Yields, sizes and quality of oranges have been significantly changed by the timing of irrigations. It appears that a program of drying the soil during October should be seriously considered . . ."

While this may not be practicable in many gardens, few gardeners will be discouraged, or convinced that any fruit is better than their own.

DESERT MAGAZINE GALLERY SCHEDULES JOHN HILTON, MARJORIE REED EXHIBITS

Two of the Southwest's most famous artists, John Hilton and Marjorie Reed, will exhibit their paintings in consecutive shows this spring at the *Desert Magazine* Pueblo Art Gallery on Highway 111 mid-way between Indio and Palm Springs. There will be no admission charge for these shows and the gallery is open from 9 a.m. to 5 p.m. every day of the week.

Hilton, whose show is scheduled for March 13 to April 3, recently has returned from a highly successful exhibit at the Grand Central Gallery in New York which was held over for two weeks by popular demand. His work has been shown at the *Desert Magazine* Pueblo for the past 10 years. He is one of the few artists who has been able to capture on canvas the subtle colorings of the desert at dawn and at sunset. John plans to be present in person with his guitar during the weekends of his show.

Miss Reed's show is scheduled to run from April 3 to April 22 and will feature a unique group of paintings commemorating the Centennial of the Butterfield Stage Route through Southern California. She is known for her portrayal of the stage coaches, horses, Indians and long vistas and mountains of the Old West. A map of the Butterfield road showing the points of interest Miss Reed selected to paint, along with her original sketches will be displayed at the show.

On Desert Slopes with the Sierrans

The Desert Peaks Section of the Sierra Club is a Southern California group which makes a hobby of exploring desert mountain ranges and climbing to their high points. For many years Louise Werner, a member of the club and an enthusiastic mountain climber, has been writing about these trips for Desert Magazine. The Desert Peakers welcome guests on these climbs.

By LOUISE TOP WERNER

Mountains Are for Everyone

Many of us have discovered that our vacation dollar buys more genuine recreation in the mountains than almost anywhere else. We don't have to invest first of all in a special wardrobe, or buy a lot of expensive equipment.

Most of us already have nearly everything you need to give it a good trial, whether we want to go in for collecting rocks, fossils or peaks; whether we're interested primarily in plant relationships or the habits of wild animals or the geologic interpretation of rock strata, whether exploring caves appeals to us, or hunting scenery with a camera, whether we merely want to give our muscles a good work-out or prefer to stroll in leisurely fashion only so far as is necessary to go to lose the sight, sound and smell of machinery.

We began exploring the recreational possibilities of mountains more than twenty years ago with an outlay of $1.69 for tennis shoes and $1.25 for two pair of wool socks. Foot comfort is a prime essential to the full enjoyment of mountains. We found the mountains just the right place to finish off jeans, slacks, shirts and sweaters no longer quite acceptable for street wear. Patches and darns were taken for granted among hikers in the Sierra Club, with whom we made our start. For two years, during which we contented ourselves with one-day trips, we found this outlay adequate.

Joining a group has many advantages. The camaraderie that develops among a group hiking together in the mountains has a flavor rich in goodwill; under such circumstances it somehow seems easier to see a man as he wants to be. An established group has a great deal of know-how about the particular area it visits—what foods are most enjoyed, how best to plan one's cooking (depending on fuel and water sources), what clothing and sleeping bag is most efficient, whether a shelter is essential, how to dress, where to find maps and literature, and what the special dangers are from poison animals or plants, lack of water, foul weather or rotten rock.

We would like to hear from mountain clubs in desert areas especially from those who would like to help promote an exchange of ideas, and invite readers to take part in their activities. Write to: MOUNTAINS ARE FOR EVERYONE, 142 Palatine Dr., Alhambra, California.

One such group is the Desert Peaks Section of the Sierra Club, a Southern California group that makes a hobby of exploring desert mountain ranges and climbing to their high points. Here is advance information about their April trip to Manly Peak in the Panamint Range. Readers who feel that this trip is within their capacity are invited to join the group.

April 6—Manly Peak
Elevation 7,196 feet. Panamint Range

The Panamint Range forms the western boundary of Death Valley in eastern California. Manly Peak, its southernmost high point, was named for Wm. Lewis Manly who in 1849, together with John Rogers, found a way out of Death Valley over this section of the Panamints, for the Bennett-Arcane party.

We will meet at 7 a.m. at the ghost town of Ballarat in Panamint Valley on the west side of the range, and caravan to the start of the climb, which will be steep, gaining about 5700 feet of elevation in five miles, but without technical difficulties. The leaders estimate the round trip will take a long day. Bring flashlight and water, as well as lunch.

If any four-wheel drive vehicles show up, Polly Connable, one of the leaders, would like to take a part of the group up Goler Wash, over Mengel Pass, into Butte Valley (an arm of Death Valley) on the opposite side of the peak and climb it from the end of the jeep road in Redlands Canyon, a short three miles of hiking, gaining about 2400 feet in elevation. This would add about 60 miles of driving and might require carrying extra gasoline. Polly plans to check this road in late March after the rains. Camp at Ballarat Saturday night.

"We Lost a Ledge of Gold" by Asa M. Russell, in the September, 1955, issue of *Desert Magazine,* gives much interesting information on this area, including a map. A topographic map of the Manly Quadrangle is available from the U.S. Geological Survey, showing this area and its immediate surroundings in great detail.

"Death Valley in '49," by J. Wilson McKenney, in the December, 1949, issue of *Desert,* reviews the story of how Manly and Rogers saved the Bennett-Arcane party.

Leader: Polly Connable, 214-A Mitscher Rd., China Lake, California.

Maps for Arizona Mountaineers?

Dear Madam:

I read your interesting column in the February issue of *Desert Magazine*. Can you tell me if there is a branch of the Sierra Club in Arizona? I would like to get maps showing desert trails suitable for overnight hikes, etc. I find the Forest Service maps here somewhat inadequate. Thank you for any information you can send.

Sincerely,
Lt. Col. R. L. Lash
Tucson, Arizona

There is no branch of the Sierra Club in Arizona. You probably know about the Kachina Mountain Club with headquarters in Phoenix. It is the only mountain club we know of in your state.

We presume you want information about maps covering your own state. Have you checked over your back issues of *Desert Magazine?*

In the *Desert Magazine* have appeared stories about mountain climbing in the Kofa Range, Castle Dome, the Chiricahuas, San Francisco Peaks, the Gila Range, and Navajo Mountain. There were maps with some of these articles, and all the back copies are available from the publishers.

The problem of securing maps showing hiking trails in desert mountains is one I think hikers will have to help solve. Such maps seem to become available only as Randall Henderson, Weldon Heald, and you and I make them, and make them available to others.

Fire Sweeps El Picacho del Diablo

Fire raged unchecked for five weeks last summer through three canyons on the flanks of El Picacho del Diablo, the highest peak in Baja California (10,130 feet, Sierra San Pedro Martyr), about 125 miles south of the border. This peak has presented some of the most intriguing route-finding problems the Desert Peakers have thus far encountered .

The three canyons burned are Diablo, Tolerdo and Del Media; the fire licked the edge of the great plateau to the west of the peak, on which grows the only sizeable stand of timber on the entire peninsula. Luckily the fire stopped short of the timber. Officials of the Mexican government went up to look at the fire but could do nothing; the nearest fire-fighting equipment was at Ensenada, 130 automobile miles

plus 25 horse-back miles plus 10 foot miles from the peak.

Desert Peakers Don Clarke and Vernon Jones of Los Angeles, who climbed the peak during Christmas vacation via Canyon Diablo, reported that canyon burned out between base-camp at about 6000 feet and the first stream fork below it, a distance of about two miles.

They sounded one hopeful note: the burned-off roots in the canyon bottom are already sprouting new growth. The cause of the fire has not been determined, as far as we know.

Articles about this area that have appeared in *Desert Magazine* by Randall Henderson: "We Climbed El Diablo from the Desert Side," Jan., 1953, and "Three Days in Devil's Canyon," Aug., 1955; by Louise Werner: "On the Trail to Picacho del Diablo," Mar., 1951.

Southwest River Runoff Forecasts Improve Following Winter Storms . . .

Heavy mid-winter precipitation has greatly improved the predicted water runoff volumes for most of the major streams of the Southwest, the U. S. Weather Bureau reported.

The rain that fell over the Colorado River Basin above Cisco generally exceeded 250 percent of the January norm. Highest percentages were observed for the Taylor Basin, averaging nearly 400 percent of normal. All forecasts for the basin reflect this heavy rainfall with increases of from 10 to 30 percent over the predictions issued last month. Near average streamflow is now in prospect for the Colorado River and its tributaries above Cameo, Colorado, and at Cisco, Utah.

The Green River basin, however, received 25 percent less than normal rainfall. The water-year streamflow for this stream at Linwood, Utah, is forecast to be 89 percent of the 1938-52 average.

The record breaking, much above normal precipitation during January over the San Juan watersheds has greatly improved the water-supply outlook there. Precipitation ranged from 300 to 450 percent of normal and the current outlook is for near-average water-year streamflow for most of the basin.

Precipitation over the Lower Colorado Basin in general also was much above normal and the current forecast for the Little Colorado at Woodruff, Arizona, is for November to June runoff of 68 percent of the 15-year average. Only about 25 percent of average runoff is forecast for the main Gila River in Arizona.

Although there were many storms during January, northern parts of the Great Salt Lake Basin had less than normal precipitation amounts. Forecasts for the Bear, Logan and upper Weber Rivers indicate that the water-year runoff will range from about 90 percent to slightly over 100 percent of the 1938-52 average.

Much above normal precipitation during January occurred over the Sevier, Beaver and Mojave basins resulting in these forecasts: Sevier, 60 to 70 percent of average; East Fork of the Sevier, 80 percent; Beaver, 70 percent; Mojave, 60 percent—an increase of 30 percent over last month's forecast.

January precipitation was below normal over the Humboldt, Truckee, Carson, Walker and Owens river basins resulting in these water flow forecasts: Humboldt, about half of the 1938-52 average; Truckee, 71 percent; Inflow between Lake Tahoe and Farad, California, 62 percent; Carson and Walker, 70 percent; Owens River near Bishop, California, 83 percent.

The water-supply outlook for the Rio Grande Basin has greatly improved. Forecasts include: Rio Grande at Del Norte, Colorado, 96 percent of the 15-year average; Rio Grande at Lobatos, Colorado, 77 percent; eastern tributaries along the Sangre de Cristo range in New Mexico, 58 to 92 percent; Rio Grande at Otowi Bridge, New Mexico, 88 percent; Pecos River headwater area, 60 to 80 percent; Inflow to Alamogordo Reservoir, 62 percent.

Hard Rock Shorty of Death Valley

"Naw, we don't have no woodpeckers aroun' here," Hard Rock Shorty was explaining to the new Park ranger who had just come to Death Valley monument. "Ain't wood fer 'em to work on—nothin' except those ironwood trees down on the lower end of the Mojave, an' the only woodpecker ever tried to drill a hole in ironwood busted his beak and starved to death.

"Remin's me o' the time ol' Pisgah Bill got one o' them smart idears o' his'n. Bill wuz workin' on a tin prospect over th' other side o' the Vinegaroon mountains. Took a lot o' blastin', and Bill run out o' drill bits. They was a war goin' on, and nobody had any bits t' sell. So Bill sat aroun' broodin' over his bad luck.

"Then one day he sez t' me. 'Shorty,' sez he, 'I don't need no drill bits. If you'll loan me that ol' truck o' yourn fer a few days I'll get somethin' to drill them holes.'

"So I let 'im have the truck an' a few days later he shows up with a big crate full o' woodpeckers. 'Got 'em over'n Arizony,' he sez, 'where all them woodpeckers live in the big cactus.'

"Next mornin' Bill wuz up early, fussin' around over at that ol' rock house by the spring. A few days later I wandered over there an' Bill explained what he wuz doin'. He had closed up all the windows with rock, all except one little hole that wuz covered with glass from an ol' car windshield. An' the woodpeckers wuz all inside.

" 'Yu see that petrified log standin' in the middle o' the floor,' sez Bill. 'I brought that back from Arizony too. Now them birds has got no place to go, and no place to drill holes 'cept in that petrified tree. I figger if they work on that awhile they'll get their peckin' tools so tough they can drill holes in rock. Then I'll taken 'em down in the mine. Ain't much light in the stone house so they'll sorta git used to workin' in the dark.'

"Well, a couple months later Bill wuz lookin' kinda droopy and I ast him how the birds wuz gettin' along.

" 'Heck!' he said. 'Them peckers got their bills plenty tough all right. I went out to look at 'em this mornin' and they wuzn't a bird in the house. They'd drilled a hole through the side o' that stone house an' gone back t' Arizony!' "

LETTERS

Collecting Field Is Closed . . .
Glendale, California

Desert:

Evidently some time had elapsed between the writing and the publishing of your field trip story about Soledad Canyon on the Mojave desert in your February issue. More recently the area around the old mine described in this story has been fenced off and posted with No Trespass signs.

I agree with Mr. Ransom, the author, that Frank and Fannie Frauenberger at the Acton store are mighty fine people, but I think you should correct your information as to the accessibility of the mineralized area at the mine.

VAL MESSENGER

Desert Magazine's editors regret that up-to-date information had not been obtained before publishing this field trip. We are at fault and we can only hope that the pleasure of meeting Frank and Fannie will compensate for the disappointment of finding the field closed to rock hunters. —R.H.

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Colorado Desert Boundary . . .
Rosemead, California

Desert:

From a biological standpoint, the northern limit of the Colorado Desert may be placed as far north as a line drawn from the Morongo Pass easterly to the Colorado River, according to the early reports of geologist W. P. Blake.

Can the dividing line between the Mojave and Colorado deserts be defined more closely?

GEORGE L. POIGNEE

Dear Mr. Poignee: In terms of local place names, we have always considered the dividing line approximately the Little San Bernardino range in this sector and further east the Eagle and Palen mountain ranges. Twentynine Palms and Rice would be a little north of this line and in the Mojave desert. This is an arbitrary line and I can quote no authority for it.—R.H.

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Trail to Rainbow Bridge . . .
Tonalea, Arizona

Desert:

Although picturesque old Rainbow Lodge was destroyed by fire and has not operated since our friends, Katherine and Bill Wilson, retired in 1952, I think your readers will be interested to know there are facilities for reaching Rainbow Bridge by horse.

We have been licensed by the Navajo Tribe since 1953 to conduct pack trips to Rainbow Bridge and the area surrounding Navajo Mountain.

These trips require two or three days from the post. The first 10 miles is by jeep and the remaining 14 by horse, using the scenic trail north of Navajo Mt. The old Rainbow Lodge trail is no longer maintained, and is nearly impassable through Red Bud Pass.

We do not recommend hiking. I say this not because we are in the business, but because too many supposedly "seasoned" hikers have had to turn back or were lost, sometimes with nearly disastrous results.

RALPH CAMERON
Navajo Mt. Trading Post

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Quizzer Queried . . .
Phoenix, Arizona

Desert:

I believe the answer to the last question in the January '57 quiz, "Most of the flagstone used for building and landscaping in the Southwest comes from—" should have been "sandstone" instead of "limestone" deposits in the Ashfork area of Arizona.

GERALD L. WOOD

Dear G. L. W.—You are right and our apologies to those who were tripped up by this answer.—R.H.

Meteorite Hunting Club . . .
Whittier, California

Desert:

How about forming a Meteorite Club? While there are many excuses for long walks on the desert, this wanderer knows of none more agreeable than "looking for a meteorite."

Once I thought I had found one and was I thrilled! But it was dolomite.

A Meteorite Club would surely receive the guidance and blessing of Dr. H. H. Nininger of Sedona.

PAUL J. LINSLEY

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Tamarack Not a Lodgepole . . .
Ellenburg, Washington

Desert:

In your magazine for January, 1957, R. H. Flournay of El Cajon, California, questions Harold O. Weight's calling your desert tree, the tamarisk, a tamarack.

I believe Flournay is in error when he says the tamarack of the Pacific Northwest also is known as lodgepole pine.

Our tamarack is a deciduous conifer that sheds its needles in the fall. It is closely related to the Eastern larch. The lodgepole pine is a true pine.

C. N. CLINESMITH

Here and There on the Desert . . . .

ARIZONA

Navajos Offer Land for Dam . . .

WINDOW ROCK — The Navajo Tribal Council has offered the federal government all the land it needs for the Glen Canyon Dam on an acre-for-acre exchange basis. The offer includes land for a proposed townsite as well as for the storage reservoir. The tribe seeks in exchange unappropriated public lands in the McCracken Mesa of Southern Utah which adjoins present tribal holdings.—*Salt Lake Tribune*

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3000 Navajos Are Christians . . .

ORAIBI—A representative of the Navajo Gospel Mission of Oraibi, Arizona, estimates that 3000 of the tribe's 76,000 members are nominal Christians. New freedoms granted over the past few years have greatly increased some of the Indians' problems, it was pointed out. Whereas, 25 years ago alcoholism was virtually unknown, today it has greatly increased, with a result that a majority of accidents and injuries can be attributed directly to the use of intoxicating beverages, the Navajo Gospel Mission representative said. Population of the tribe has increased 26,000 in the past 25 years.—*Hemet News*

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Navajo Attacks Peyote Ban . . .

PRESCOTT — Arrested in December under a tribal ordinance forbidding the use of peyote, Mike Kayonnie recently brought habeas corpus action against P. H. Nelson, chief of Navajo police, claiming the tribal ban was unconstitutional because it bars religious freedom. Kayonnie's attorneys compared the use of peyote as a religious sacrament to the use of wine in other religions. The peyote plant is a spineless cactus and its use is claimed to bring about dreamy spiritual or psychological experiences. State and federal laws specifically prohibit the use of peyote, which is classed as a narcotic. Users of the plant include thousands of Indians who are loosely organized in a nation-wide group called the Native American Church.—Yuma *Sun*

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Sun Furnace To Be Built . . .

PHOENIX — Announcement was made at the closing session of the recent Solar Furnace Symposium, that the hottest sun furnace in the world will be constructed somewhere in Southern Arizona at a cost of at least $1,000,000. Arizona State College, Tempe, currently has the largest sun furnace in the state, a huge 60-inch instrument being used in high temperature metallurgical research for the Navy.—*The Arizonan*

Historical Society Created . . .

HOLBROOK — Civic leaders of Navajo and Apache counties have formed an interim committee to work toward the organization of a permanent Navajo-Apache Historical Society. Senator William R. Bourdon of Snowflake was named interim chairman of the group. A convention is scheduled to be held at the Holbrook Courthouse on April 13 for representatives of the various communities in the two counties.—Holbrook *Tribune-News*

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State Park Plan Advances . . .

PHOENIX — The 30-year struggle to establish a state park system in Arizona appeared headed for fulfillment as the state House of Representatives passed a bill to create a seven-member board to draft plans. The present bill limits the board to acquiring 160-acre sites without specific legislative approval.—Phoenix *Gazette*

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Marriage Law Puzzles Indians . . .

HOLBROOK—Several Navajo and Hopi Indian couples have been refused marriage licenses for nonconformation with the blood-test requirement that went into effect December 3. Officials reported that many of the couples, married for years "by the Indian Law," do not understand the necessity of securing a blood-test. — *Holbrook Tribune*

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Hopis Reaffirm Peaceful Ways . . .

ORAIBI — White Bear, a full-blooded Hopi whose family is believed to have established the oldest constantly inhabited village on this continent, thinks Hopi philosophy will never allow yielding the uranium and coal under their reservation land. "At no time will we allow the Creator's gift to us to be used for a destructive purpose," he declared in a talk at a Phoenix church. It is this peaceful Hopi philosophy and rigidity of belief that is open to misunderstanding, he believes.—*Phoenix Gazette*

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CALIFORNIA

Action on Road Imminent . . .

GLAMIS — Spurred on by U. S. Senator Thomas H. Kuchel of California, final governmental action appeared imminent on the long-awaited Imperial Valley to Palo Verde Valley road. Payment of $660,000 to Imperial County for construction of a new road across the sand hills between Brawley and Glamis was approved by Congress last year. The road will replace an original route by way of Niland and passing through the Navy's Chocolate Mountain bombing range which has been closed to public use.—*Palo Verde Valley Times*

Museum Fund Drive Underway . . .

PALM SPRINGS — Solicitation in the $200,000 building fund campaign for the Palm Springs Desert Museum was started immediately after a mid-January luncheon attended by 60 civic and business leaders who will serve as captains in the special gifts section of the drive. Philip L. Boyd, former Palm Springs mayor and land developer, gave the keynote address at the kickoff luncheon.—*Desert Sun*

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Death Valley Housing Started . . .

DEATH VALLEY — The Death Valley '49ers Association sponsored ground breaking ceremonies that officially launched construction of a new residential area for Park Service Personnel at Death Valley National Monument. Before actual construction of the Death Valley Museum, for which the State of California has appropriated $350,000, can be started, the '49ers said it will be necessary to determine the answers to such questions as the exact location of the museum, whether the State of California or the Federal Government's Park Service will administer and maintain the building, and what provisions must be made for its operation.—*Inyo Register*

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Power Plant Tests End . . .

PILOT KNOB—Tests on the new Pilot Knob power plant, built for the Imperial Irrigation District, have been described as very successful. The installation is on the All-American Canal and its two generators are capable of producing 30,000 kilowatts of electricity. A new power line in the area to carry away the generated power is now under construction.—*Yuma Sun*

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Court Rules Burro Not Game . . .

EITWANDA — The Justice Court in Eitwanda decreed that wild burros are not game, in a case involving two men from Colton who were arrested by officers of the California Division of Fish and Game for possessing three live wild burros. The court ordered the animals returned to their native habitat near Trona and fined the two offenders $500. They were placed on two years' probation.—*Barstow Printer-Review*

Salton Sea Fails to Rise . . .

SALTON SEA—For the first time in several years, the Salton Sea did not rise during 1956. In fact, the sea's surface, 235.31 feet below sea level, is two inches lower than it was a year ago. — *Banning Record*

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NEVADA

Avalanche-Fighters Get Cannons . . .

RENO—The U. S. Forest Service will receive a valuable assist in avalanche control work from Sixth Army installations through the loan of five 75 mm. recoiless cannon and the training of Forest Service crews to operate the weapons. The rifles will be used to trigger the release of unstable snow masses which become a serious hazard to the growing number of people who are flocking to alpine ski slopes on national forest lands.—*Nevada State Journal*

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Balloons May Carry A-Bombs . . .

LAS VEGAS—The AEC disclosed that full-scale experiments will begin at the test site 75 miles north of Las Vegas to determine the feasibility of employing helium gas bags as inexpensive detonation platforms for atomic bomb test shots. The AEC believes balloon suspension explosions are a cheaper means of studying nuclear explosions.—*Yuma Sun*

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Curtiss-Wright Seeks Water . . .

FALLON — A year-around supply of as much as 20 second feet of water flow will be required by Curtiss-Wright Corporation for its future plant and townsite development in western Nevada, it was reported. It was understood that most of the water needed by the firm would be for plant operation, plus a lesser amount for domestic use at the housing site.—*Nevada State Journal*

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Lake Mead Improvements Asked . . .

BOULDER CITY—Funds amounting to $839,847 have been requested for the Lake Mead area for fiscal year 1958. Park Service officials said the request was a portion of the $10,244,000 projected last year to be spent over the next 10 years in developing the Lake Mead Recreational area. A breakdown of funds for various departments is as follows: roads and trails, $72,600; buildings and utilities, $408,600; management and protection funds, $165,247; maintenance and rehabilitation of physical facilities, $193,400.—*Nevada State Journal*

THE DESERT TRADING POST

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SCENIC GUIDE to Arizona by Johnson. New 1957 edition, completely revised. Accurate maps, pictures and descriptions, alphabetically arranged. Price $1.00 postpaid. Scenic Guides to Oregon, Nevada, Colorado and California by Heald, $1.50 each. Send for our "Selected List of Books on Western Travel and Rock Collecting." 37 titles to choose from. Address—Scenic Guides, Box 288, Susanville, California.

DESERT MAGAZINE Back Issues wanted. We will pay $5 for November, 1937 issue; $2.00 for February, 1939; and $1.00 for March, 1939. Must be in good condition. Mail to Desert Magazine Circulation Department, Palm Desert, California.

COMPLETE VOLUMES Desert Magazine for sale, including Volume One. John Youngkin, 1631 Oakdale Street, Pasadena, California.

INDIAN GOODS

FIVE FINE Prehistoric Indian arrowheads $2.00. Perfect stone tomahawk $2.20. Effigy pipe $5.00. Perfect flint thunderbird $3.00. Flint fish hook $3.00. List free. Five offers for only $12.00. Arrowhead, Glenwood, Arkansas.

FINE RESERVATION-MADE Navajo and Zuni jewelry. Old pawn. Hundreds of fine old baskets, moderately priced, in excellent condition. Navajo rugs, old and new, Bayeta, native dyes, Two Gray Hills. Artifacts and gems. A collector's paradise! Open daily 10 to 5:30, closed Mondays, Buffalo Trading Post, Highway 18, Apple Valley, California.

AUTHENTIC INDIAN Jewelry, Navajo Rugs, War Bonnets, Squaw Dresses, Squaw Boots, Fine old Indian collection. Pow-Wow Indian Trading Post, 19967 Ventura Blvd., East Woodland Hills, Cal.

FOR SALE—Large size Indian olla. Can be seen at Banner store. Highway 78. Best offer. Andy Willison, Box 182, Julian, California.

IROQUOIS MASK $25.00; pipe-tomahawk $27.50; catlinite peace-pipe $12.50; 5 arrowheads $1.00; strand trade beads, $1.00. Iron pointed African spear with shaft $7.50. Paul Summers, Canyon, Texas.

RARE ITEMS for interior decoration, collectors. Authentic Navaho, Hopi and Zuni jewelry, old pawn. Large collection old Indian pottery, baskets, kachinas. No catalogs but inquiries invited. The Navaho Shop, 1133 N. La Brea Avenue, Inglewood, California. ORchard 4-8717.

SELLING 100,000 Indian relics. 100 nice ancient arrowheads $25.00. Small grooved stone tomahawk $2.00. Large grooved stone tomahawk $3.00. Perfect spearhead over 8 inches long $20.00. Flint scalping knife $1.00. Indian skull $25.00. Ancient water bottle from grave $7.00. List free. Lear's. Glenwood, Arkansas.

REAL ESTATE

CHOICE HOMESITES and acreage. Salton Sea vicinity. For full information write Pon & Co., Box 46 DA, Azusa, California.

CLEAN METICULOUSLY farmed 80 acres in heart of Coachella Valley showing $20,000 net. Ronald L. Johnson, broker, Box 162, Thermal, California.

LIVE YOUR DREAM! Recent rain guarantees wonderful desert blossoms. We'll be here all summer to take you up into the mountains or out on the desert. Specimens, cutting rock, Indian artifacts, old mines — all sorts, good schools, roads, utilities, water readily available, healthful climate almost dust-free, uninterrupted views from your land whether half-acre lot or quarter section. Prices reasonable, terms. Darlington and Palmer, Realtors, P.O. Box 214, Cavecreek, Arizona.

OWNER WOULD like to trade summer home site in Central Oregon for winter home site in Southern California or Arizona. 40 acres fine young pine timber, excellent spring water, good deer hunting, 17 miles from town over mountain roads. Write Lonesome Forty, Route 1, Box 357, Prineville, Oregon.

WANTED TO RENT or buy: building with living quarters. Prefer 6-395 between Walker Pass to Lone Pine. Anna Golambos, 8113 Cypress Ave., South Gate, Cal.

CRAFTS—HOBBIES

PAINT OILS: Exciting home-courses. Trial lesson $1.00, specify landscape or still-life. Folders free. Prickett's Desertwind Studios, Millerton, New York.

UNIQUE MANZANITA jewelry, hand thrown pottery, material for dry arrangements—all made in Julian. Mineral specimens, antiques, paintings. Apple Mountain Workshop, Box 403, Julian, Calif.

MISCELLANEOUS

REAL "DO-IT-YOURSELF" Books! Want a Pool? Read "Let's Build a Swimming Pool!"—$1.00. Want to Pan Gold? Read "Gold Panning for Profit"—$1.00. Both Books $1.50. J. Robertson, Box 604, Stockton, California.

GHOST TOWN ITEMS: Sun-colored glass, *amethyst to royal purple; ghost railroads* materials, tickets; limited odd items from camps of the '60s. Write your interest—Box 64-D, Smith, Nevada.

TRAVEL UNITED STATES by horseback via picture postcards of Pack Train Family. Sample 10c, eleven all different $1, different card every day for year $9, story $1. PTF, 1544G Maiden Lane, Springfield, Ohio.

JOIN A REAL Prospectors and Rockhounds organization. Amateurs welcome. Many benefits for members. Membership $2.50 year, includes publication "Panning Gold." United Prospectors, 701½ East Edgeware, Los Angeles, California.

LADY GODIVA "The World's Finest Beautifier." For women who wish to become beautiful, for women who wish to remain beautiful. An outstanding desert cream. For information, write or call Lola Barnes, 963 N. Oakland, Pasadena 6, Calif., or phone SYcamore 4-2378.

SECTIONIZED COUNTY maps — San Bernardino $1; Riverside $1; Imperial 50c; San Diego 50c; Inyo 75c; other California counties $1.25 each. Nevada counties $1 each. Topographic maps of all mapped areas. Westwide Maps Co., 114 W. Third St., Los Angeles, California.

ANTIQUE WALL phones. Excellent condition. $9.95; two $18.50. Luscious purple sage honey—raw, thick. Organically grown dried fruit, nuts. Free circular. Tontz Honey Farm and Country Store, old highway 71, Elsinore, California. Open every day.

VERMONT MAPLE syrup—direct from sugar orchard to you. Guaranteed pure Grade A syrup. All shipments postpaid and insured. Check or money order must accompany order. $8.95 per gallon; $4.75 per ½ gallon. M. G. Corti, Walden, Vermont.

BARRY STORM—famed writer "Thunder God's Gold," "Practical Prospecting," etc., (see Cardex files most public libraries) has ready for publication:

TALES OF THE SOUTHWEST.

Incredible frontier stories of miners, Indians, gunfighters, cowboys, outlaws, pioneer women, adventurers, considered capable making dozen to one profit on speculative investment in year or two plus probable additional thousands royalties from pocketbook rights. Need fifty only actual copyright co-owners underwrite printing, advertising, national book store, library exploitation. $75 per each 1/100th co-owner copyright interest, payable $10 down, balance 90 days. 56 year book copyright life. I operate deal, own half interest. (No high gross income tax on co-partnerships. Pay only own share as received). Book publishing contract for actual copyright co-ownership sent on approval or upon receipt of first payment. STORM PUBLISHING ASSOCIATES, Box 74, Inyokern, California.

FOR SALE: unframed original desert and Nevada photos, sketches, water colors, and oil paintings. W. R. Averett, 709 N. 18th, Las Vegas, Nevada.

TREASURE HUNTERS—Join active hunts on June 1, Treasure Hunter's Day. Armchair hunters welcome, too. Local chapters now forming. Interesting Circular free. Treasure Trove Club, Williamsburg, New Mexico.

PAN GOLD: $1 for 75 panning areas in 25 California counties. Geological formations, elevations, pertinent notes. Panning pans $2.75, $2.25. Leather nugget and dust poke $1. Fred Mark, Box 801, Ojai, California.

NEW MEXICO

Secret Base Now Open . . .

LOS ALAMOS—The Atomic Energy Commission announced that Los Alamos has become an "Open City." The decision applies only to the restrictions on the town's gates. There will be no relaxation of controls over the access to the Los Alamos Scientific Laboratory or its technical installation. Restrictions covering flying in the Los Alamos vicinity and use of the local airport will be continued. Since the secret base was founded in 1943, admission has required a pass. — *New Mexican*

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Indian Health Needs Cited . . .

SANTA FE—Dr. James R. Shaw, head of the Division of Indian Health, U. S. Public Health Service, reported that the average age at time of death for Indians is only 39, compared with 60 for the general population. A third of the deaths among them occur before the fifth year of life, he pointed out. More than half the general population survives beyond the age of 30, but substantially fewer than half of the Indians attain even the age of 20, Dr. Shaw added. Statistics show that of every thousand Indian babies born, more than 65 will not live to be one year old, whereas the average for the general population is 27.—*New Mexican*

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Indians Propose New County . . .

SANTA FE — The New Mexico state legislature has been asked to form a new county embracing all the Navajo Indian Reservation lands in the northwestern corner of the state. Sam Ahkeah, former tribal chairman, said the decision to form the state's 33rd county was based on the feeling that his people were capable of handling their own county affairs. The land in question covers 4500 square miles and is inhabited by 25,000 Navajos.—*Adahooniligii*

UTAH

Forest Recreation to Expand . . .

WASHINGTON, D. C.—Operation Outdoors, a five-year plan to double camping and picnicking facilities in the national forests to meet a steadily building demand for such facilities, was announced by the U. S. Department of Agriculture. Recreation visits to the national forests will hit the 66,000,000 mark by 1962, Forest Service officials predict. The program has two aims: solving the problem of ever-increasing family outdoor activities; improvement and management of wildlife habitat in cooperation with state game departments.—*Southern Utah News*

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Glen Bridge Job Awarded . . .

KANAB — Judson-Kiewit-Pacific-Murphy Construction Syndicate of Emeryville, California, was awarded a contract to build the high bridge over the Colorado River near the site of the new Glen Canyon dam. The syndicate's bid was $4,139,277. The State of Arizona will contribute 25 percent of the cost of construction, it was reported. It is expected that the bridge will be completed before actual building of the dam is started. The span will be used for construction work of the dam and will replace the high line cables such as were used during construction of Hoover Dam.

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Glen Recreation Area Proposed . . .

WASHINGTON, D. C. — Senator Arthur V. Watkins of Utah requested Secretary of the Interior Fred A. Seaton to study the possibility of early establishment of a national recreation area at the site of the great inland lake to be formed by construction of Glen Canyon Dam of the Colorado River Storage Project. Anxious river runners who in years past have conducted individuals and expeditions down the canyons of the river from Mexican Hat and Hite, Utah, to Lees Ferry, Arizona, prompted the request. —*San Juan Record*

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Coyotes Controlled from Air . . .

VERNAL—Fish and Wildlife Service trappers have taken to the air in an effort to control coyotes. Snow conditions must be just right for this type hunting, the trappers said. They track down the coyotes and then swoop down in a light plane to just 10 feet above the ground and shoot the animals with a 12-gauge shotgun loaded with BBs.—*Vernal Express*

MINES and MINING

Twentynine Palms, California . . .

A reconnaissance geologic map of a large previously unmapped part of the southeastern Mojave Desert has been released for public inspection by the U. S. Geological Survey. The map covers an area of about 3500 square miles north and east of Twentynine Palms and south of the Union Pacific Railroad. It includes the Cady, Bristol, Old Dad, Granite, Bullion, Sheephole, Coxcomb and Iron Mountains, and the basins containing Bristol, Cadiz, Danby and Dale Dry Lakes. The map has been placed in open file in the libraries of the Geological Survey in Menlo Park; in the office of the Geological Survey, Claremont, and 1031 Bartlett Building, Los Angeles; and the office of the California Division of Mines, San Francisco.

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Goldfield, Nevada . . .

Revival of operations at the Newmont Mill by the Monarch Milling and Mining Co. has begun with production of mercury from ores mined at Ione and the Ralston mine, 17 miles south. The Monarch company took over the mill last September and immediately started putting the plant in readiness with installation of a special retort furnace and other equipment to produce quicksilver. The mill is the largest in Nevada to adopt the floatation concentration process for treatment of mercury ores. —*Humboldt Star*

New York, New York . . .

The U. S. aluminum industry has caught up with demand and is now turning its attention to the development of new end uses to guarantee its growth. For the first time since the war, the metal now is freely available. Leaders of the industry feel that improved supply of the metal will allow development of new end uses that up to now has been hindered by shortages of aluminum. Principal advantages of aluminum are its light weight, easy workability and freedom from rust.—*Humboldt Star*

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Calico, California . . .

Fred Noler, in charge of restoring the old ghost town of Calico for Knotts Berry Farm, present owners of the property, said there still was $2,000,000 worth of silver ore blocked out at the former boom camp. Calico thrived from 1881 to 1895.—*Desert Valley News-Herald*

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Las Vegas, Nevada . . .

Flintkote Company has purchased the United States Lime Products Corporation. U.S. Lime is the largest producer of lime products in the West. Flintkote's entry into the lime field is a natural one because, as a building material, lime fits in with Flintkote's present line of products and channels of distribution, I. J. Harvey, Jr., president of the corporation, said. — *Nevada State Journal*

Henderson, Nevada . . .

E. R. Rowley, president of Titanium Metals Corporation, predicted that Henderson will become a titanium producing center, with the eventual establishment of a rolling mill at the Basic Plant. The plant currently is producing 6000 tons of metal a year and with completion of the expansion program now underway, production will be increased to 9000 tons, Rowley said. —*Pioche Record*

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Boron, California . . .

Three deep test holes are scheduled to be drilled at the Four Corners east of Boron, the U.S. Geological Survey announced. The tests will be part of the government agency's search for the element boron in all its compounds. Object of the geological scouting expedition, which has been in progress since August, 1952, is to pin point, if possible, all surface or underground deposits yielding boron and other chemicals, or to otherwise indicate formations in which the chemicals might be located.—*Boron Enterprise*

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Grants, New Mexico . . .

Dow Chemical Co. announced the start of construction on the firm's proposed distribution facilities at Grants. The service station for uranium producers in this area will be equipped to handle storage and distribution of 50 percent caustic solution, soda ash, and other Dow chemicals for the mining industry.—*Grants Beacon*

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Carson City, Nevada . . .

Value for the metals and minerals output of Nevada for the year 1956 was the greatest in the history of the state, the Nevada Mining Association reported. A preliminary survey gives the estimated value of 1956 production at $124,283,200 of which metals accounted for $107,890,000; nonmetallics $16,393,200; and crude oil, $108,000. The increase over 1955 was due largely to a $10,000,000 increase in the value of copper production; $2,750,000 in iron; and about $1,000,000 each in lead and zinc.—*Nevada State Journal*

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Flagstaff, Arizona . . .

Gold values in gravel deposits that could be used in Glen Canyon Dam developments were under dispute by mining claim holders and the government. The latter is contending that the claims are invalid because there was no market for the gravel when the Bureau of Reclamation asked withdrawal of the sites in June, 1954. The gold values in the claims were termed insignificant by the government.—*Phoenix Gazette*

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Pioche, Nevada . . .

Old mercury mines throughout the United States are being reactivated and prospectors are actively looking for new deposits, especially in California, Nevada and Oregon. Not only is the present price of $255 per flask attractive, but the mining fraternity is awakening to the new uses being developed for this ancient metal. The "liquid silver" has top secret and strategic uses in guided missiles, and as a coolerant and heat exchanger in atomic reactors.—*Pioche Record*

Washington, D. C. . . .

The Department of Interior reported that the value of mineral production in the United States reached a new high of $17.3 billion in 1956, a gain of more than $1 billion over 1955. Greatest gain was made by petroleum which had a value of $7.3 billion, up $500 million from 1955. The increase in total value was due mostly to greater production, although price rises for some commodities also contributed. Most prices were steady, the Department of Interior said.—*Yuma Sun*

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Four Corners Area . . .

Six oil companies formed a pipeline company to move crude oil from the Four Corners area of Utah and New Mexico to refineries in Los Angeles. The firm, Four Corners Pipe Line Co., proposes to build a 600-mile, 16-inch trunk line from the Navajo Reservation in southeast Utah to Los Angeles by way of Seligman, Arizona; Topock, Arizona; and Banning, California. Initial capacity of the $50,000,000 line will be 60,000 barrels a day. Stockholders in the new line are Continental Pipe Line Co., 10 percent; Shell Oil Co., 25 percent; Gulf Oil Corp., 20 percent; Richfield Oil Corp., 10 percent; Standard Oil Co. of California, 25 percent; and Superior Oil Co., 10 percent.—*New Mexican*

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Salt Lake City, Utah . . .

Reserves of iron ore in the Iron Mountain area of Utah total 350,000,000 tons, the U. S. Bureau of Mines reported. Of this total, 100,000,000 tons containing 45-50 percent iron is recoverable at this time and greater reserves at deeper levels were predicted. If all the potential ore of the district was of direct shipping grade and mineable by the open-pit methods now in use, an adequate low-cost ore supply would be assured for at least 35 years, the Bureau of Mines said. Efficient mining, block caving and low cost concentration would be required to develop the remaining 250,000,000 tons of submarginal ores.—*Salt Lake Tribune*

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Washington, D. C. . . .

The rulings of the Bureau of Land Management no longer are the final word in decisions regarding mining claims. Secretary Fred A. Seaton of the Interior Department said contests on mining claim validity must be held before an impartial hearings officer. Seaton's ruling is the first break through in the application of the Administrative Procedure Act of 1946 to hearings in public land matters. This act provides, among other things, that no officer shall preside at the reception of evidence at hearings if such officer is "responsible to or subject to the supervision or direction of any officer, employee, or agent engaged in the performance of investigative or prosecuting functions."—*Pioche Record*

URANIUM NEWS

Electrical, Sea Power Needs for Uranium Growing

Electrical generating stations in the United States will be consuming from 20,000 to 30,000 tons of uranium annually in the next two decades, AEC member Dr. Willard L. Libby said.

"If you assume the same requirements for the rest of the free world—and they might be considerably higher—a world requirement of from 40,000 to 100,000 tons of U308 is indicated," he declared.

During that period, the bulk of U308 consumed by new, non-governmental uses, will be for initial inventories of reactors and their auxiliary fuel processing systems. A lesser amount will be needed to replace the fuel consumed each year.

"Although the present and near future demand for uranium is mostly military, a new non-military market for uranium is opening up," he said. "It is based on stationary reactors for electrical power and reactors for merchant ship propulsion."

Dr. Libby also said that the new bilateral agreements entered into by this country with foreign nations offer opportunities for domestic producers to compete for a share of the international market. He said nuclear energy should within the near future be a successful competitor with fossil fuels in running the ships of the seas.—*Salt Lake Tribune*

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U-Ore Depletion Feared In Five Years on Plateau

Announced reserves of uranium on the Utah, Colorado and Arizona segments of the Colorado Plateau are "sufficient to sustain uranium mills for only about five years' operation," Phillip L. Merritt of E. J. Long-

year & Co., New York, and former assistant director of exploration for the Division of Raw Materials, Atomic Energy Commission, declared.

"Obviously, continued discoveries will have to be made in order to maintain production beyond 1962, and I am confident that this can be done," he said.

But he added that "present indications are that much of the easy ore on the Colorado Plateau has been found and that more costly exploration involving deeper and more expensive drilling for hidden ore bodies will be required in the future." He said the U-ore miner would for the next decade be largely dependent on the government for a market. —*Salt Lake Tribune*

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South African Uranium Mines No Threat to U.S.

United States uranium miners have nothing to fear from South African competition if a free market for uranium develops, declared George O. Argall, Jr., *Mining World* editor. His studies show that under existing British and United States government contracts, the South African miners have a very good thing in uranium. Declared profits by 20 mines vary from $3.32 to $10.70 per pound of uranium oxide. Profits per pound for many African companies are higher than the total gross price paid some U.S. producers for equivalent products.

But, in comparison with U.S. reserve, the South African ore, largely a by-product of gold mining, is very low grade.

While existing long-term contracts are in effect, South African producers are making lots of money, but it is high-cost uranium and could not meet United States' competition for commercial uses if free trading in uranium concentrates becomes a reality.—*Humboldt Star*

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Happy Jack Mine May Try Open Pit Operation

The Happy Jack uranium mine at White Canyon, San Juan County, Utah, may be mined at least in part by open pit operations. More than 1,000,000 tons of overburden could be removed from the underground properties now controlled by Texas-Zinc Minerals Co. by such methods. Texas-Zinc is building a 750-ton-a-day mill at Mexican Hat, Utah.

Not only is Texas-Zinc considering open pit work on what has been considered by many as a traditional underground operation, but expansion of open cut mining to new uranium areas of the West is forecast by mining men.—*Salt Lake Tribune*

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Uranium Ore Hunt Shows Slackening, DMEA Says

The Defense Mineral Exploration Administration said the quest for uranium ore in this nation still is vigorous, although it slackened slightly last year following the 1951-55 boom. The DMEA has been participating in a multi-million-dollar prospecting program in search of critical minerals. During the past six years, DMEA received 669 applications for federal funds to help finance searchers for uranium and many more covering other minerals. Of the uranium applications, 179 were submitted in 1956.

DMEA has signed 151 contracts agreeing to put up a maximum of $4,620,000 for uranium exploration in partnership with prospectors. The agency rejected 324 applications and 134 were withdrawn. Sixty still are in process.

DMEA officials believe that about $50,000,000 of potential new resources will result from each million invested by the government.—*New Mexican*

Long-Range Study to Probe Health Hazards of U-Mining

Uranium mining is being investigated as a possible cause of cancer.

Evidence is not conclusive that uranium mining is harmful to the miners, but experience in Europe makes it suspect.

To safeguard American miners, a medical study into the after-effects of uranium mining is being conducted. Duncan A. Holaday, director of Public Health Service at Salt Lake City, said approximately 1300 men with known experience in underground uranium mining were examined in the summer of 1954, and their health status and occupational histories recorded.

The medical studies will be repeated every three years, and during the intervening years, a census will be taken to see how many of the group are still employed in the mines and to keep in touch with those who have left the industry. Ultimate hope of the program is to accumulate data which will give estimates of the levels of radioactive dust and gas which were actually present in the mines during periods of operation. Such information was missing in the European case history, leaving conclusions about the toxic effects on humans inconclusive.—*Pioche Record*

TRUE OR FALSE ANSWERS

Questions are on page 18

1—False. When there is sufficient rainfall the dunes are a blaze of color.
2—True.
3—False. Pauline Weaver was a man—a scout and prospector.
4—False. Hassayampa is the name of an Arizona river.
5—False. The road-runner when frightened may take off for a short flight.
6—False. Capital of Nevada is Carson City.
7—False. Tamarisk was imported to United States from North Africa early this century.
8—True. 9—True.
10—False. The Rio Grande is the largest river in New Mexico.
11—True.
12—False. Fossilization of wood took place under water.
13—True. 14—True. 15—True.
16—True. 17—True.
18—False. The languages of the Navajo and Hopi have little in common.
19—False. Hoskinini was a Navajo.
20—True.

GEMS AND MINERALS

ROCKHOUNDS WELCOME TO PETRIFIED WOOD SAMPLES, NEVADA COMMISSION RULES

The Nevada State Park Commission has further clarified its position regarding the taking of petrified wood by collectors. The new interpretation of the laws prohibiting petrified wood taking is more lenient, J. W. Calhoun, director of the Nevada State Museum said.

"It is unlawful to remove petrified wood from a monument, State Park, or any locality posted by the State Park Commission. Commercial hunters are not welcome," Calhoun said. "The laws were enacted to protect from vandalism the natural specimens in situ; that is, petrified stumps, trees, etc. With the exception of the restricted areas noted above, rockhounds are welcome to samples, but should not be greedy."

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ENLARGED DEALER SHOW FOR SAN FERNANDO VALLEY FAIR

Plans for the Second Annual Mineral Dealers Show, to be held in conjunction with the San Fernando Valley Fair at Devonshire Downs, California, August 29-September 2, were announced. An estimated 90,000 persons will see the exhibits.

Daily contests in cutting and polishing stones are scheduled along with the selection of a "Queen of Diamonds" to represent the rockhound industry.

In last year's experimental show, 14 booths were occupied and the show proved so successful that this year application has been made for 40 booths, show officials announced.

Dealers desiring more information should contact Albert Keilin, 13814 Ventura Blvd., Sherman Oaks, California.

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NEW ROCKHOUND CLUB FOR SIMI VALLEY, CALIF., AREA

A new gem and mineral society — the Simi Valley, California, Rockhounds, recently was organized. Meetings are scheduled for the second Tuesday evening of each month at the Simi Valley Mineral Co. on Highway 118 between Simi and Santa Susana. Local residents desiring information regarding the club should call FIreside 62130 or 61014.

FEDERATION ANNOUNCES JUNIOR ESSAY CONTEST

The American Federation of Mineralogical Societies announced an essay contest for Junior Rockhounds. Here are the rules:

1. Any junior member (or any regular member who is 16 years of age or under by May 1, 1957) of any club which is a member of the American Federation through a regional federation, may enter.
2. Each entry shall be entirely the work of the junior member submitting it.
3. The subject of the essay shall be "Ethics of a Rockhound," and shall be not over 2000 words in length.
4. Each entry must be accompanied by a statement from the Secretary of the sponsoring club, stating that the author is a junior member in good standing.
5. All entries are to be mailed to: Vincent Morgan, P.O. Box 542, Boron, California. Deadline for entries is May 1, 1957.
6. Prizes are a $50 U.S. Savings bond for first prize, and a $25 bond for second prize. Winners will be announced at the American Federation Convention in Denver.
7. The decision of the judges is final.

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The Rogue Gem and Geology Club of Grants Pass, Oregon, is planning its fifth annual gem and mineral show for June 22-23 at the County Fair Grounds. Show hours are 10 a.m. to 10 p.m. on the 22nd and 10 a.m. to 6 p.m. on the 23rd.

April 27-28 are the dates chosen by members of the Shasta Gem and Mineral Society for their seventh annual show. The event is scheduled to take place at the Veterans Memorial Building in Redding, California. Show hours are 10 a.m. to 10 p.m., Saturday the 27th; and 10 a.m. to 8 p.m., Sunday the 28th.

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The 20th mineral and lapidary show of the Southwest Mineralogists is scheduled for April 27 from noon to 10 p.m. and on the following day from 10 a.m. to 6 p.m. at the Palestine Masonic Temple, 41st Place and Figueroa street in Los Angeles, California. Admission is free and refreshments will be served.

TWO COLLECTING AREAS CLOSED TO ORDINARY CARS

The California Federation made the following report on these collecting areas: Cerro Gordo Mine—the steep 14 percent grade road to the mine has been surfaced with loose gravel; only four-wheel drive vehicles can reach the mine. Imperial County Calcite Mine—a heavy storm has completely washed out the road and it is doubtful that even jeeps can drive within two or three miles of the mine.—*The Sphere*

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The Texas Federation of Mineral Societies will hold its annual convention and show May 3, 4 and 5 at the Bexar County Coliseum, San Antonio, Texas. The San Antonio Rock and Lapidary Society is the host club. The show will be held in the exposition building on the Coliseum grounds, and its theme is "A Rock Hound's Show—By Rock Hounds—For Rock Hounds." Exhibitors and dealers should contact the show chairman, Raymond Rock, 322 Arlington, San Antonio, Texas.

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The San Fernando Valley, California, Mineral and Gem Society has set October 19 and 20 as dates for its 16th annual mineral and gem show. It is scheduled to be held at the Victory-Van Owen Recreation Building, 12240 Archwood Street, North Hollywood.

More Gem Clubs Name Officers For Coming Year

Pete Eagle is the new president of the Long Beach, California, Mineral and Gem Society. Also named to office were Marguerite Bunch, vice president; Peggy Patch, secretary; and Carl Brenner, treasurer.—*Mineral News*

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These new officers were elected by members of the Ventura, California, Gem and Mineral Society: Bruno Benson, president; J. Renger, director; Ted Lemmon, secretary; E. R. Hall, treasurer; and Virginia Van-Delinder, editor.—*Rockhound Rambling*

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Ralph Johnson, president; Claude Walborn, vice president; Mrs. Henry Nichols, secretary; and M. P. Springer, treasurer; are the newly elected officers of the Eastern Sierra Gem and Mineral Club of Independence, California.—*Inyo Independent*

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New officers of the Gem Cutters Guild of Baltimore, Maryland, are Elmer Gissel, president; Robert White, vice president; John Wise, treasurer; Edward Geisler, assistant treasurer; Etta Davison, recording secretary; and Catherine Muffoletto, corresponding secretary.—*Gem Cutters News*

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Primo Martini will head the Southern Siskiyou Gem and Mineral Society of McCloud, California, in the coming year. Other new officers are Hi Wellman, vice president; Irene Correa, secretary-treasurer; and Fern Dunlap, federation director.—*Siskiyou Gem*

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The Dona Ana County Rockhounds of Las Cruces, New Mexico, elected these new officers: Lyle Waddell, president; Hugh Derham, vice president; Mrs. Lesla Markley, secretary; Max Opitz, treasurer; Elton Love, editor; and Mrs. Faye Cruzon, historian.—*Citizen*

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The following new officers were elected by members of the Contra Costa Mineral and Gem Society of Walnut Creek, California: Joan Soule, president; Bob Smith, vice president; Edythe Landregan, secretary; and Gerald Hemrich, treasurer.

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Elected to head the South Bay Lapidary and Mineral Society of Hermosa Beach, California, was Harry Johnson. Walt Reely will serve as vice president; Richard Storm, treasurer; Pat Biluk, corresponding secretary; and Dorothy Boyer, recording secretary.—*Agatizer*

1957 NATIONAL GEM AND MINERAL SHOW
DENVER, COLORADO
June 13-14-15-16
National Guard Armory
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Joint American and Rocky Mountain Federation Convention and Show
Woodruff and Parser Trophies to be awarded
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E. E. PARSHALL, publicity
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New officers of the El Paso, Texas, Mineral and Gem Society are C. E. Ross, president; Hugh A. Derham, vice president; James H. Brown, secretary; H. H. Berryhill, treasurer; Mrs. Hortense Newell, historian; R. H. Miller, trustee; H. L. Zollars, bulletin editor; and Mrs. Grace Zollars, assistant editor.—*The Voice*

* * *

Lillian Coleman was re-elected president of the Sacramento, California, Mineral Society. Also named to office were Gene Krueger, vice president; Fred Johns, recording secretary; Louise Philbrook, financial secretary; and Luther Ford, treasurer.

* * *

Clay Scott was elected president of the San Jacinto-Hemet, California, Rockhounds club along with Webb Parker, vice president; Katherine Kelly, secretary; W. M. Meddles, field trip chairman; Erwin Rasch, federation director; and Walter Zeiders, alternate federation director.—*Hemet News*

* * *

New officers of the Mother Lode Mineral Society of Modesto, California, are Lois Wemyss, president; Evelyn Etnyre, vice president; Marjorie Hollingsworth, secretary-treasurer; Clarence Hadley, field trip director; O. W. Halteman, house director; and Frances Harris, editor.—*Ghost Sheet*

* * *

New officers of the Sequoia Mineral Society of Reedley, California, are Sylvia Dial, president; Hershel Owen, vice president; Geneva Hamilton, secretary; Mabel Anderson, treasurer; Len McCreary, federation director; and Chris Anderson, Minnie LaRoche, Forrest Minch and Wm. Wedel, trustees.—*Sequoia Bulletin*

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NOVEL BAROQUE MOUNTINGS ELIMINATE LARGE CAPS

Emil Mueller of the El Paso, Texas, Mineral and Gem Society, has devised a novel manner by which to mount selected baroque gems without the bulk and sometimes oversize appearance of the regular six-prong cap.

After the tumbled gems are selected and a decision made as to how they are to hang, the point or portion which is to be upward is carefully ground off on a 220-grit wheel leaving a smooth, flat surface about 3/16 inch in diameter.

A small drill is made from a 3/16 inch soft steel or brass rod, about three inches long, with small slots cut in one end with a jeweler's saw or thin hacksaw, across two directions about ⅛ inch apart.

The baroques are placed in a shallow tray which has been filled with a rather thick mixture of molding cement and water, with the ground-off ends level, and the plaster allowed to harden.

The slotted drill is then placed in the chuck of any drill press set to run at regular speeds, and the embedded baroques in the tray of plaster are placed on the table of the drill press. Eighty grit silicon carbide grains, 220 grit, or diamond powder or bort can be used on the face of the small drill and a round depression, about 1/32 inch is made on the flattened portion of each gem. After the shallow holes have been sunk, the baroques are washed, and, using glyptal cement and tiny pads—small rings with a round base 3/16 inch in diameter—are cemented into the holes in the direction in which the stones are to be suspended, making a very neat mounting, especially for clear gems which might show a dark shadow if holes were drilled and tiny screw-eyes inserted.—*The Voice*

NEW MAN-MADE SUBSTANCE CAN SCRATCH DIAMOND

A man-made substance, borazon, is so hard it can scratch a diamond, General Electric scientists who developed this new material claimed. Borazon was created through the application of tremendous pressure and heat and its cubic crystal formation is said to be strikingly similar to that of a diamond. The new product, the announcement said, is expected to have far-reaching impact in industrial polishing and cutting operations. Its resistance to heat is double that of diamonds but it has no apparent value as a gem.—*Phoenix Gazette*

GEM MART

ADVERTISING RATE
12c a word . . . Minimum $2.00

FIRE AGATE—ground to show the fire, you finish it. $2, $3 and $5 each. B&H Rock Shop, 29 Cherry Lane, Granbury, Texas.

VISIT GOLD Pan Rock Shop. Beautiful sphere material, gems, mineral specimens, choice crystals, gem materials, jewelry, baroques, etc. Over 100 tons of material to select from. John and Etta James, proprietors, 2020 N. Carson Street, Carson City, Nevada.

ROCKS—opposite West End Air Base, agate, woods, minerals, books, local information. No mail orders please. Ironwood Rock Shop, Highway 60-70 West of Blythe, California.

OPALS, BRILLIANT colors, direct from mine, 15 for $5.00. 10 ringsize cabochons (opal, amethyst, onyx, etc.) $5.00. Kendall's, Sanmiguel d'Allende, Guanajuanto, Mexico.

TUMBLED GEMS of the desert for sale. Agates, jaspers, obsidians, etc. Mixed lots $4 per pound. T & J Rockhounds, 9000 National Blvd., Los Angeles 34, California.

LARGE VARIETY mixed tumbled stone—tigereye, agates, obsidian, palm root, quartz. 40-60 stones in pound—only $4. Free: matched preforms with every pound purchased. Route 1, Box 369, Beaumont, California.

HAVE REAL FUN with desert gems, minerals and rocks. The rockhound's how-to-do-it magazine tells how. One year (12 issues) only $3.00. Sample 25c. Gems and Minerals, Box 687-D, Mentone, California.

CALCITE CRYSTAL groups. Drousy $2; $3; $5. Ask for list. Jack the Rockhound, Carbondale, Colorado, P. O. Box 245.

GEMS OF THE desert, tumbled polished baroques. Mexican lace and carnelian agate, Death Valley jasper agate, rose quartz, petrified wood palm, black fig, many others. General mixture, $6 pound. Mexican agate slices and various cuff link preforms. Slabs and findings. Earring size tumbled turquoise $8 pound, larger size $1 ounce. Price list. Golden West Gem Co., 7355 Lankershim Blvd., North Hollywood, California.

OPALIZED WOOD 65c pound plus postage. A. B. Cutler, Box 32, Salmon, Idaho. Slabs, tumbled, J. E. Cutler, Gearhart, Oregon.

SURPLUS TUMBLED gems. Less than wholesale. Mixed material and sizes. Petrified wood, rose quartz, agate, obsidian and others. Two pounds for $5; 10 pounds $22.50 postpaid. Western Minerals, Box 61, Boulder City, Nevada.

OPEN 8 A.M. to 5 P.M. Monday through Friday. Other hours by appointment or when home. Residence back of shop. Mile west on U.S. 66. McShan's Gem Shop, Box 22, Needles, California.

GENUINE TURQUOISE: Natural color, blue and bluish green, cut and polished Cabochons—25 carats (5 to 10 stones according to size) $3.50 including tax, postpaid in U.S.A. Package 50 carats (10 to 20 cabochons) $6.15 including tax, postpaid in U.S.A. Elliott Gem & Mineral Shop, 235 E. Seaside Blvd., Long Beach 2, California.

GEMS A-PLENTY: Beautiful baroque gems, large variety, tumbled polished all over, $10.00 for one pound (about 100 stones). 10 lbs. of top grade gemstone prepaid for $7.00. Wholesale price to dealers on baroque gems and gemstone in the rough. Satisfaction guaranteed on every sale. San Fernando Valley Gem Co., 5905 Kester Ave., Van Nuys, California.

CHRYSOCOLLA SPECIMENS, some with free gold. $1 prepaid. Rocks and Minerals, Box 156, Lone Pine, California.

MINERALS FROM way out East. Brilliant fluorescent willemite, clinohedrite, calcite, hardystonite, calcium-larsenite, etc. Also snow-white radiating pectolite, gemmy green prehnite and others. Prices depend on size and quality. R. Hauck, 49 Montgomery St., Bloomfield, New Jersey.

1½ TONS of an Oregon rockhound's collection of gem material and Hanilpton Butte wood. Price $500. Mrs. Elizabeth Houston, Box 643, Prineville, Oregon.

OPALS AND Sapphires direct from Australia. Special—this month's best buy: Fine cut genuine sapphires; one black star sapphire; one blue star sapphire; one blue faceted sapphire; one sapphire cabochon. Each over one carat—all for $18. Free airmailed. Send personal check, international money order, bank draft. Free 16 page list of all Australian Gemstones. Australian Gem Trading Co., 49 Elizabeth Street, Melbourne, Australia.

C. EARL NAPIER "for rocks." 19 Lake View, Boulder City, Nevada. Free guide service to collecting areas.

CALLING CONNOISSEUR collectors — a gem so rare and dazzling! Unique in all-around qualities, 7 to 8 in hardness, luster polish. Rainbow colors flashing on fire, it's entertainment beyond description! Will sacrifice collection for $10,000. Responsible collectors only please write — Gems, P.O. Box 1062, Blythe, California.

FOR SALE: Beautiful purple petrified wood with uranium, pyrolusite, manganite. Nice sample $1.00 Postage. Maggie Baker, Box 7, Hackberry, Arizona.

COLORADO MINERAL specimens, cutting and tumbling materials. Send 2 cent stamp for list and terms. Dealers please write for wholesale list. John Patrick, Idaho Springs, Colorado.

THE CONTINENTAL Minerals (formerly Rocky Mountain Minerals) welcomes your orders and inquiries about massive and also crystallized mineral specimens. No cutting material. Free list. This month special: Nice Azurite crystal clusters and rare earth minerals. Box 1206, Anaconda, Montana.

12 POUNDS OF beautiful Colorado mineral specimens, $8.00 prepaid. Ask for list of others. Jack the Rockhound, P. O. Box 245, Carbondale, Colorado.

ONLY DIAMONDS OUTSHINE MULTI-COLORED ZIRCONS

Zircon, which comes in many colors, was known in medieval times as a cure for insomnia, plague and other ills. The striking characteristics of the zircon are its brilliancy and fire. Among the popular gems it is outshone only by the diamond.

The most popular zircon color is a rich blue. Other colors include pale honey, golden yellow, red and leaf green. Certain of these colors are improved by the careful application of heat.

Because zircon gems of good size can be bought for moderate prices, they are an excellent choice for dramatic designs in bracelets, earrings, clips and pins.

Chief source of zircons are the gravel beds of Ceylon and they usually are found with rubies, sapphires, spinels and garnets. —South Gate, California, Mineral and Lapidary Club's *Boulder Buster Press*

"QUOTES"

FROM THE GEM AND MINERAL WORLD

You can learn more about a man in a week in the woods than in a year in the city. The ideal camp companion may be large or small, weak or strong, an old timer or a beginner—but if he is willing, nothing else matters. If he is all in but not a quitter; if he is able to joke when tired and wet; if he will do his share and then some—this is the man you want to go with on your next trip.—*Sequoia Bulletin*

* * *

One of our members had been seriously ill, and during the period of recuperation had the new-found hobby of stone-cutting to fall back on. He was grateful for it and we are glad he had found it. What more would one want to recommend our organization?—Evansville, Indiana, Lapidary Society's *News Letter*

AMATEUR GEM CUTTER

By DR. H. C. DAKE, Editor of The Mineralogist

The comparative hardness of gem minerals is difficult to determine by hand testing where there is only a slight variation. It is, however, a simple matter to separate those which vary one degree or more, like quartz from topaz.

Hardness testing can best be carried out with special points made for that purpose. These are more satisfactory than attempting to place a scratch with a large blunt point. Tests made on a smooth surface can be examined with a low power glass to note any scratching. Valuable gems should be handled with care. The girdle is the place generally tested for hardness and the slight "dust" of abrasion should not be confused with an actual scratch.

Moh's scale of hardness, used in all standard texts on mineralogy, fails to properly indicate the actual difference between the various gems. On Moh's scale, sapphire is listed as nine and diamond as ten, but the latter is actually at least ten times harder. The tables below may serve to show the actual differences:

	Moh's	Gem Scale
Diamond	10	10,000
Norbide	9½	4,000
Sapphire	9	1,000
Topaz	8	450
Zircon	7½	350
Quartz	7	250
Agate (average)		225
Steel file		200
Opal (variable)		150
Knife blade		100
Glass (variable)		100
Malachite		0
Calcite		00

* * *

During the past few years a number of new polishing powders have been introduced to the gem cutters. These include the widely used "micron" powders of diamond and synthetic sapphire, widely used in facet work. These have been developed through new methods by which the powders may be graded quite accurately within close limits of tolerance.

The meaning of "micron" sizes is explained here: A micron being .001 millimeter or .00003937 inches. These "superfine" sizes as are used in polishing gems (like synthetic sapphires) are graded as follows—Micron size No. 1 with the largest particle 2 microns in diameter. This is equivalent to standard grit size of about 12,500.

Micron size No. 2, with smallest particle about 1 micron, and largest 3 microns in diameter, or equivalent to standard grit size of about 5000 mesh.

Micron size No. 3, having smallest particle 1 micron, and largest 5 microns, or standard grit of about 2500. The micron size designated at 3x, is slightly larger, having a standard grit size of about 2,250. While there are various other graded micron sizes the 3 and 3x are the most widely used in facet polishing in the gem cutting industry.

Serving as a link between the purely useful and the purely ornamental, brooches have long held a rather unique position among articles of jewelry. The term "brooch" is used for almost any temporary and removable arrangement which holds two parts of a garment together. Neither hooks and eyes, nor buckles would come under this definition. Brooches have been popular for many centuries among Europeans, but the brooch, as we know it, was and is hardly used in the Orient.

The simplest and earliest is a "safety-pin" form, which consists of a pin, a hinge, a spring, and a bow. From this earliest form, many fastening improvements have been developed. These improvements represent the attempts made by various craftsmen to circumvent the natural inclination of the simple skewer-shaped pin to work out of the fabric which it was intended to hold together.

A great many types of brooches were in use during the Iron Age. However, the use of bronze was not discontinued when the Bronze Age ended. The safety pin or catch was developed at an early date, and the Romans appear to have used the safety-pin form of brooch almost exclusively.

At the outset, brooches were made almost soley of various metals and alloys, including silver and gold. During the 18th and 19th centuries, brooches were elaborately decorated with enamels and various cut stones, and some were of considerable size. This tendency has prevailed to the present day. At one time cameo brooches were the style.

* * *

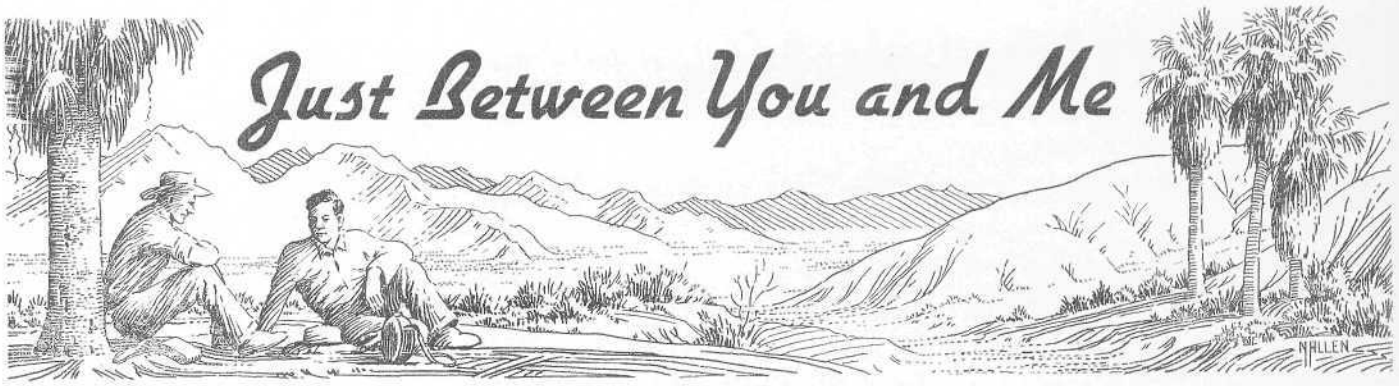
The light under which a gem stone is viewed will have a considerable effect in bringing out the brilliancy, color, fire, flaws and other properties of the stone.

In a dark room by the light of a single candle the diamond will stand out and reveal all its brilliant glory and "fire," By the light of a campfire the diamond also is very brilliant and under a battery of powerful electric lights the diamond will reveal its dancing flames of fire. However, these types of illumination are not used to grade diamonds commercially, and neither is it advisable to judge or purchase a stone based solely upon its appearance under these circumstances. Good daylight illumination is indicated to note inclusions or imperfections in diamonds.

As a contrast, a fire opal shows to best advantage when viewed in direct sunlight, hence opal jewelry will prove most effective when worn on a bright sunny day. By candlelight or campfire the opal is relatively a dull stone. In general the well-colored gems, dependent upon color for their beauty, are best revealed in daylight.

* * *

Both professional and amateur lapidaries will encounter difficulties in polishing the long table on a rectangular step cut olivine or zircon. Scratches may appear on the large facets of this material that are most annoying to eliminate. Often this can be immediately eliminated by removing the stone from the dop and recementing in such a fashion as to present the opposite side of the facet to the lap wheel. Why this should be effective is open to debate, but it is effective when other remedies have failed. It is a little difficult to reset the stone in the cement at the proper angle but with a little practice and patience it can be accomplished.



By RANDALL HENDERSON

MY MAIL the last few days has been filled with letters of protest against the proposal of a member of the Los Angeles County board of supervisors that the desert be made a dumping ground for garbage from the metropolitan area. The story appeared in the Los Angeles papers two weeks ago.

A similar suggestion three years ago aroused so much opposition it was dropped. Not only are all desert dwellers opposed to the idea, but many of the protestants are city dwellers in Los Angeles County—folks who regard the desert as their playground, and want its landscape kept clean and its air unpolluted.

I can sympathize with Los Angeles in its need for a garbage dump. We have a similar problem in our Coachella Valley. But other large cities in the United States have found a solution—and it wasn't on the desert because they have no desert for a dumping ground. And you may be sure we desert dwellers will not permit our land of far horizons to become a city dump if we can help it.

* * *

Thanks to the interest of DeWeese W. Stevens, vice principal of the Palo Verde high school, a program has been initiated for the restoration and protection of the "Giant Figures" on the desert mesa 20 miles north of Blythe, California.

Under the leadership of Stevens, the student council at the high school has pledged its efforts to restore these ancient Indian relics, and the Blythe chamber of commerce and Desert Protective Council have promised financial aid to carry out the project.

The figures, consisting of gigantic men, animals and reptiles, formed by raking the varnish covered malpai rocks into outlines, were discovered in 1932 by an aviator flying overhead. The California Department of National Resources placed historical markers there, but in the absence of protective measures the site has been overrun and the figures mutilated. However, complete restoration is possible, based on aerial photographs taken at the time of the discovery.

When the task is completed, I'll be publishing the story—with proper credit to the teen-agers who have pledged many days of hard work in carrying out the program.

* * *

Two Arizona university professors have offered a program drastic and alarming to those of us who have a sense of reverence for the natural landscape.

As a step toward the solution of Arizona's urgent need for water, they have proposed that great areas of forest and chaparral land in the White Mountain watershed of the Salt River be stripped of its natural cover and reseeded to forage grass. They would start by clearing the spruce and fir trees from the upper slopes of the Apache Indian reservation, and according to newspaper reports they have persuaded the Indians that this would be advantageous to them.

Obviously, such a program would meet with the approval of the cattlemen in that region. Also, it is quite certain that the flood runoff into Roosevelt and the other reservoirs in the Salt River would be increased.

But what of the price that will be paid for these immediate benefits? What will happen to the storage capacity if the flood debris of bare mountain slopes is poured into Roosevelt Lake? What will be the impact of great torrents of water following storms of cloudburst proportions, or warm winds on a deep and exposed snow pack? Or the effects on the underground water reservoirs which feed springs and ranchers' wells at the lower levels?

These are the more obvious questions which may be asked. No less important from the long range viewpoint are the far-reaching ecological results which follow when the balance of Nature is disturbed over a wide area—the destruction of the natural enemies of insect pests and rodents. We humans do not know much about such things yet—but we do have a record of what happened in south China when great areas of forest lands were denuded of their trees and the soil washed away—leaving a land so poor that much of the Chinese emigration to all parts of the world has come from this region.

Aside from the purely economic factors involved, I am reluctant to believe that our sense of moral obligation to future generations of Americans has reached so low a point that we are ready to start stripping our land of the natural life and beauty which are so much a part of the heritage of western America.

* * *

Up in Monument Valley just beyond the northern border of Arizona are two buttes named Mitchell and Merrick in memory of two prospectors. They were reputed to have found a rich silver mine on the Navajo reservation, and were taking some of their loot out of the country when they were overtaken and killed by the tribesmen whose land they were robbing.

Harry Goulding, who has spent most of his mature life in Monument Valley, and who knows the Navajo better perhaps than any other white man, has told me more than once that the Indians killed Mitchell and Merrick, not because they were stealing silver from the reservation, but because these men had desecrated the Good Earth, the Mother from whom derives all the blessings of life in this universe. That is part of the Navajo religion.

Somehow I feel that the problems of the litterbug, the vandal, the destroyer, man's greed, and even of peace on earth will be solved only after our schools and our churches begin teaching reverence for the land and the life which is on it—for truly these are our great gifts from the Creator.

BOOKS of the SOUTHWEST

PIONEER WILDFLOWER BOOK ON CALIFORNIA REPRINTED

In the late 1890s two young women —one a writer and the other an artist —hiked over the width and breadth of California seeking out the Golden State's wildflowers. They wanted to write a book about what was to them the culmination of Nature's blessings upon this coastal empire.

"There has been a long felt need of a popular work upon the wildflowers of California," wrote Mary Elizabeth Parsons in the preface to *The Wild Flowers of California*. "Though celebrated throughout the world for their wealth and beauty, and though many of them have found their way across the waters and endeared themselves to plant lovers in many a foreign garden, the story of their home life has never yet been told."

What Mary Parsons saw and wrote about on those hikes and what her companion, Margaret Warriner Buck, illustrated, has delighted outdoor lovers since 1897, for flowers were more than stalks, blossoms and leaves to these naturalists.

A new edition of this book recently was released. It is unaltered from the last printing in 1930 except for additions of six watercolor plates by Margaret Buck and an appendix which brings the scientific names of the plants up to date and gives currently accepted plant names.

This is a book to carry with you into the field. And after you read it and use it you will better understand what these two women wanted to do for us by pointing out that a flower is not ". . . a trivial thing only worthy of a passing glance. To the mind open to the great truths of the universe, it takes on a deeper significance. Such a mind sees in its often humble beginnings the genesis of things far-reaching and mighty."

Published by California Academy of Sciences, San Francisco; illustrated; with key to the flowering plants; index, glossary and appendix; 423 pages; $3.95.

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ARIZONA TRAVEL ADVENTURES DESCRIBED BY THOS. LESURE

Writing with the authority of one who has been over every inch of the trail he describes for his readers, travel writer Thomas B. Lesure tells of the wonders of his adopted state in a new book entitled, *Adventures in Arizona*. It will be sure to please those who want to get the most out of their actual or arm-chair visits to that delightful land of contrasts.

Lesure combines a vivid imagination, which makes even the most routine side jaunts real adventures as he takes you back into time to tell you of the area's history and local legends; with a realistic approach to road conditions, supplies needed, travel hazards, etc.

On every page is an appeal, an invitation to park your car, get out and walk around—to see and smell and feel the things most tourists miss when they stick close to the main-traveled roads.

The book is divided into three main parts—Northern, Central and Southern Arizona—for the convenience of the traveling reader. Also included are special sections on Indian handicraft —what you can expect to find, how much to pay for it and what to look for in the product; fishing on the desert; horseback riding and dude ranches; and ghost towns.

One hundred of the book's 270 pages are devoted to full-page photographs, many taken by the author.

Published by the Naylor Company, San Antonio, Texas; $5.00.

Desert Best Seller List*

1. *Ghosts of the Glory Trail* Nell Murbarger $5.75
2. *Geological Story of Death Valley* Thomas Clements $1.50
3. *Wild Palms of the California Desert* Randall Henderson $ .50
4. *Rocks and Minerals of California* Vinson Brown & David Allan paper $2.75 cloth $4.50
5. *Poisonous Dwellers of the Desert* Natt N. Dodge $ .50

*Based on February sales by Desert Magazine Bookshop.

Books reviewed on these pages are available at Desert Crafts Shop Palm Desert, California

Add three percent sales tax on orders to be sent to California

Write for complete catalog of Southwestern books

THE DESERT PROTECTIVE COUNCIL, INC.

A NON-PROFIT ORGANIZATION

To safeguard for wise and reverent use by this and succeeding generations those desert areas of unique scenic, scientific, historical, spiritual and recreational value and to educate by all appropriate means children and adults to a better understanding of the desert.

Gathered around a blazing campfire of desert driftwood in October, 1954, a little group of conservation minded desert and mountain dwellers banded themselves together in an association whose immediate goal was to preserve the integrity of California's Joshua Tree National Monument.

The Monument was facing threats from two sources: One small faction calling themselves the Desert chapter of the Western Mining Council was seeking to have the Monument thrown open to prospecting and mining. This, despite the fact that the Monument is sprinkled with the "coyote holes" of prospectors who had sought in vain for 75 years to find mineral wealth there. The other group was seeking to promote a commercial highway through the Monument, in violation of the time-honored code that national parks and monuments shall be held inviolate against commercial exploitation.

The campfire meeting was held at the entrance to Deep Canyon, where the Santa Rosa Mountains meet the desert floor of Coachella Valley, home of California's date growing industry. Less than 40 persons were present at that first meeting, but they were outspoken in behalf of a common cause—to organize not only for the protection of Joshua Tree National Monument, but for the preservation of scenic, scientific, historical, recreational and spiritual values anywhere on the desert that these values might be threatened.

As an outgrowth of that meeting there was formed the Desert Protective Council, a non-profit corporation, with Harry C. James a widely recognized leader in conservation activities as its first president.

In the two and one-half years since the Council was formed its membership has been expanded to include representatives of all the five southwestern states—Arizona, California, Nevada, New Mexico and Utah. Its advisory panel includes leading scientists, educators and journalists whose high standing in their professions is well known.

Within the past year the by-laws of the Council were amended to provide for an executive director who would be the administrative officer of the ever-expanding activities of the organization. Harry James stepped down from the presidency to assume this role. Although it is not a salaried position, he and Mrs. James devote many hours every day at Lolomi, their mountain home in the San Jacinto Mountains overlooking Banning, California, to the research and correspondence involved in a job that could only be filled by those dedicated to the highest goals of human endeavor.

Although the protection of Joshua Tree National Monument remains one of the prime interests of the Council, its influence is now being brought to bear in many directions, including—

Protection of desert terrain against unrestricted acquisition by the armed forces.

Revision of fish and game codes in conformity with the findings of scientific study.

Protection of bighorn sheep and other near-extinct species of wildlife.

Continued ban on hunting in state and national parks.

Extension of state and national park and recreational areas to provide outdoor space for increasing population.

Restoration and preservation of historical monuments.

Establishment of roadside park and picnic facilities along desert highways.

Protection of the scenic landscape including drastic limitation on billboards.

Continued crusade through legal and educational processes against road and campsite litter and vandalism.

Membership in the Council is as follows:

Active membership is open to all adults interested in the purposes of the Council. Annual dues $1.00 or more a year.

Junior membership is open to children who subscribe to the objectives of the Council. Dues for Junior membership —50 cents.

Contributing membership is open to individuals and organizations interested in aiding financially in the work of the Council.

Organization membership is open to all organizations subscribing to the Council's purpose. Dues $5.00 or more a year.

Membership in the Desert Protective Council is open to all who subscribe to the purposes of the organization as set forth above. Membership applications accompanied by fee as above should be mailed to

DESERT PROTECTIVE COUNCIL
P. O. Box 716
Banning, California